M-AUDIO

ProKeys Sono 88

User Guide

GENERAL MIDI

Introduction . . . 3
ProKeys Sono 88 Features . . . 4
What's in the Box? . . . 4
Keyboard . . . 4
Built-in Audio Interface . . . 4
Minimum Requirements . . . 5
Standalone Operation . . . 5
Bus-Powered Operation . . . 5
Controls and Connectors . . . 6
Top Panel Diagram . . . 6
Top Panel Descriptions . . . 6
Rear Panel Descriptions: . . . 8
Hardware Connections . . . 9
Audio Inputs . . . 9
Audio Outputs . . . 9
MIDI Connections . . . 9
Other Connections . . . 9
Example Operating Scenarios . . . 10
About the audio inputs . . . 11
ProKeys Sono as a Standalone Instrument . . . 12
ProKeys Sono Premium Voice Selection . . . 12
Layer Mode . . . 12
ProKeys Sono GM sound selection . . . 13
ProKeys Sono as a Standalone Microphone Preamplifier and Mixer . . . 14
ProKeys Sono Demos . . . 14
Basic ProKeys Sono Setup in Windows . . . 15
ProKeys Sono Setup in Mac OS X . . . 16
Using ProKeys Sono with a Computer . . . 17
Audio Tracks . . . 17
MIDI Tracks . . . 21
ProKeys Sono Audio Setup and Controls . . . 24
Using the Microphone and Instrument Inputs . . . 24
Setting Input Gain . . . 24
Using the Aux Inputs . . . 25
Using Direct Monitoring . . . 25
The Mono Button . . . 26
The ProKeys Sono Audio Control Panel (Windows Only) . . . 27
Latency . . . 27
About . . . 27

Routing MIDI Data to and from your Computer . . . 28
Routing MIDI Signals to your Software . . . 29
Routing MIDI Signals from your Software . . . 29
Advanced ProKeys Sono Functions in Edit Mode . . . 30
Audio Options in Edit Mode . . . 30
Button, Knob, Wheel and Pedal Jack Assignments . . . 31
ProKeys MIDI Output Settings . . . 36
Sending a Bank Change or Program Change Message . . . 38
MIDI Messages In-Depth . . . 39
Program & Bank Changes . . . 39
NRPN/RPNs . . . 40
Troubleshooting . . . 41
Appendices - Useful MIDI Data . . . 43
Appendix A - General MIDI Instruments . . . 43
Appendix B - Channel 10 Drum Map . . . 44
Appendix C - Standard MIDI Controller Numbers (MIDI CCs) . . . 45
Appendix D - Additional RPN Messages. . . . 46
Technical Specifications . . . 47
Technical Info . . . 48
Warranty . . . 48

Introduction

Congratulations on your purchase of M-Audio ProKeys Sono 88. ProKeys Sono 88 is a semi-weighted, velocity sensitive 88-key digital piano, USB-compatible MIDI controller, and an audio interface in one convenient package. Play the on-board premium keyboard sounds as a standalone instrument or plug a microphone and guitar into ProKeys Sono and record, edit and produce your performance via your computer utilizing the included recording software. ProKeys Sono provides everything to instantly transform your computer into a versatile music studio.

ProKeys Sono functions as a class-compliant device when connected to your computer via USB. This means your computer will recognize the keyboard without the need to install additional drivers[1] and will have immediate access to all audio inputs and outputs as well as to the built-in MIDI interface. However, as you become more familiar with ProKeys Sono, you may wish to take advantage of this device's additional professional features by installing the ProKeys Sono drivers.

Installing the ProKeys Sono drivers in Windows improves audio performance by reducing latency. Latency is the time it takes for MIDI input (when using software synthesizers) or audio input signal to appear as audio at the ProKeys Sono audio outputs for monitoring. Windows users will gain additional functionality from installing the ProKeys Sono drivers including: using your new keyboard with more than one application at the same time (multi-client), the ability to send large SysEx messages, as well as using your ProKeys Sono with a qualified version of the Pro Tools M-Powered recording software. On a Macintosh, installing the M-Audio drivers enables you to use your ProKeys Sono with a qualified version of the Pro Tools M-Powered recording software.

Information on Windows driver installation can be found in the printed Quick Start Guide included with your new ProKeys Sono. Macintosh driver installation instructions are in the "ProKeys Sono 88 Setup in OS X" chapter of this User Guide.

Finally, keep in mind that ProKeys Sono can be used with any third-party music program. Be sure to read your specific application's documentation to learn more about how it can best be used with this device.

[1] When using ProKeys Sono as a class-compliant device in Windows (i.e., without installing drivers), the computer will search for the M-Audio DFU (device firmware upgrade tool) and display a Found New Hardware Wizard. The M-Audio DFU is a component of ProKeys Sono 88 that is enabled when the M-Audio drivers are installed, but is not necessary for class-compliant operation. As a result, the Found New Hardware Wizard and can safely be ignored in this scenario. *See page 15 to learn more about this topic.*

ProKeys Sono 88 Features

Keyboard:

- 88 semi-weighted, velocity sensitive keys
- 7 high-quality voices (Grand Piano, Bright Piano, Electric Piano, Organ, Clavinet, Strings, Choir)
- General MIDI (GM) sound set with a total of 128 built-in sounds for playback of MIDI files
- Layer mode for playing two voices simultaneously
- On-board reverb and chorus effects
- Pitch Bend wheel
- Modulation wheel; MIDI re-assignable
- Voice Volume knob; MIDI re-assignable
- Transpose up/down buttons; MIDI re-assignable
- Sustain pedal input; MIDI re-assignable
- MIDI output jack
- 40-note maximum polyphony [2]
- Edit mode for advanced functions and programming
- Bus-powered through USB or DC power for standalone functionality (DC power adaptor sold separately)
- Class-compliant operation: no driver installation required– simply connect the keyboard and power ons[1]

Built-in Audio Interface:

- 16-Bit, 44.1 kHz, 2-in, 2-out audio interface
- XLR microphone input, 1/4” instrument input, and stereo RCA inputs
- Two rear-panel 1/4” main outputs
- Two front-panel 1/4” headphone outputs
- Dedicated Instrument and Microphone gain control knobs with signal and peak LEDs
- Direct Monitor knob for near-zero latency monitoring

[2] Stereo premium voices operate at a maximum polyphony of 20 notes. Layering two voices may further reduce polyphony.

What’s in the Box?

- M-Audio ProKeys Sono 88 keyboard
- Printed Quick Start Guide
- M-Audio ProKeys Sono Drivers and Documentation CD-ROM
- Software Bundle CD-ROM
- USB cable

If any of the above listed items are missing, please contact the retailer where you purchased the product.

Minimum Requirements

optional USB-type external power supply

Standalone Operation

Standalone operation refers to using ProKeys Sono without a computer. To do this, an optional 9V, 500mA center-positive power supply or USB-type power supply is required. More information on available power supplies can be found at www.m-audio.com.

Bus-Powered Operation

In bus-powered mode, ProKeys Sono is connected to a PC or Mac with a USB cable and receives power through the USB connection. When using ProKeys Sono in this mode, your computer system must meet the following minimum specifications:

M-Audio ProKeys Sono 88		
Windows XP (SP2) [3] • Pentium® III 1GHz or AMD K7 Athlon 1GHz *(CPU may be higher for laptops)* • 512 MB RAM • One native USB port *[3] Home and Professional Edition only. Windows Media Center Edition is not currently supported.*	**Windows Vista 32-bit** • Pentium® 4 1.6GHz or AMD Athlon XP 2800+ *(CPU may be higher for laptops)* • 1 GB RAM • 128 MB Graphics Card • One native USB port	**Mac OS X** [4] • Macintosh G4 1GHz† • OS X 10.4.11 with 512 MB RAM • OS X 10.5.2 with 512 MB RAM • One native USB port *[4] G4 accelerator cards are not supported.*

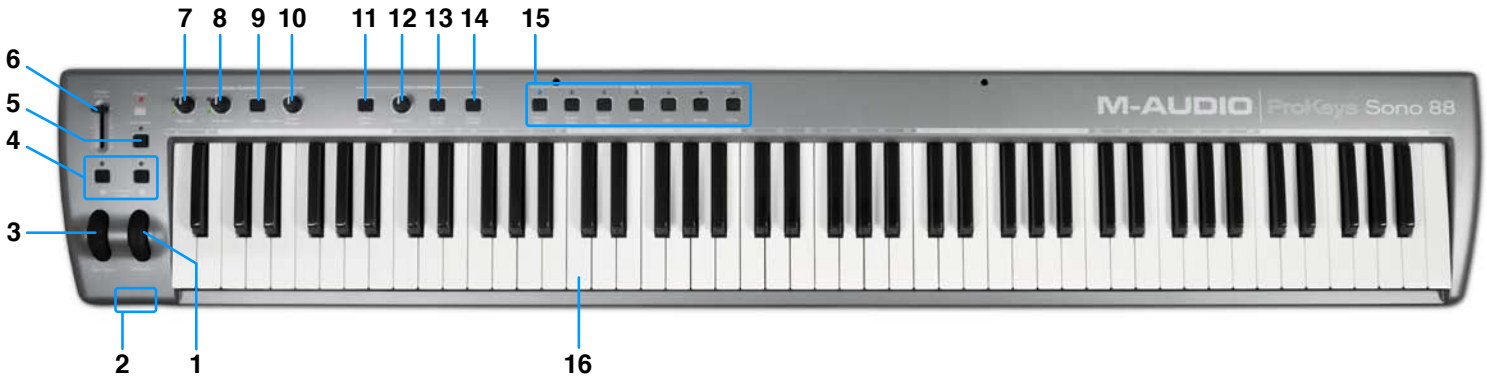
M-Audio suggests you also check the minimum system requirements for any software applications you plan on using with your new M-Audio hardware, as they may be greater than the above.

➜ ***IMPORTANT**: Connect your headphones or powered speakers to ProKeys Sono. Sounds created by ProKeys Sono and from software used with it will play through the main outputs on ProKeys Sono–not the outputs of your computer's built-in soundcard.*

***A Note About System Updates**: Please check the M-Audio driver download page at http://www.m-audio.com/drivers for the availability of an updated driver before you decide to install operating system updates. Before new M-Audio device drivers are released, they are tested for use with the operating system versions that are available at that time. When updates for an operating system are released by Microsoft or Apple, all M-Audio device drivers have to be re-tested and possibly updated to ensure proper operation. M-Audio recommends refraining from installing operating system updates until a driver has been posted to the M-Audio website for that specific operating system.*

Controls and Connectors

Top Panel Diagram



Top Panel Descriptions

1. **Modulation Wheel (Modulation):** This wheel is used to add expressivity to your performance by changing the intensity of certain effects. The Modulation wheel usually controls vibrato (change in intonation) or tremolo (change in volume) of your selected sound. The MIDI data range of this wheel is 0 to 127, with 0 being the note-unchanged position (i.e., the wheel is rolled downward toward the user).

   Note that the Modulation wheel can be assigned to control MIDI parameters other than modulation (MIDI CC 1). This topic is covered in the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide.

2. **Headphone Outputs (Phones):** These two output jacks accept standard 1/4" headphones. The volume of these outputs is controlled by the Master Volume fader (6).

3. **Pitch Bend Wheel (Pitch Bend):** This wheel lets you create expressive changes in your performances by raising and lowering pitch. Rolling the Pitch Bend wheel upward will raise an instrument's pitch whereas rolling it downward will lower the pitch. Note that this wheel is spring-mounted and will return to the center position when released.

4. **Transpose (Data) < > Buttons:** In this User Guide, these buttons will be referred to as the Data buttons. By default, these buttons transpose the keyboard in half-step increments. Pressing the Data > button (right) will shift the notes played on the keyboard up one half-step (for example, D becomes D-sharp). When shifted upward, the LED above the right Data button will illuminate. Pressing the Data < button (left) will shift the notes played on the keyboard downward (for example, G becomes G-flat) and the LED above the left Data button LED will illuminate. Pressing both Data buttons together will "center" the keyboard and restore the default transpose state (Transpose shift = 0) and any illuminated Data button LEDs will turn off.

   The Data buttons can also be assigned to send different MIDI messages or control other features on ProKeys Sono. This is explained in the "Advanced ProKeys Sono Functions in Edit Mode" section of this User Guide.

5. **Edit Mode Button (Edit Mode):** When this button is pressed, the associated LED illuminates and the keyboard enters "Edit mode." While in this mode, the keys on the keyboard no longer transmit MIDI notes, and are instead used to select advanced functions and enter data. The "Advanced ProKeys Sono Functions in Edit Mode" section of this User Guide contains more detailed information about Edit mode. Press this button again to exit Edit mode.

6. **Master Volume Fader (Master Volume):** The Master Volume fader controls the level of the main outputs (17) as well as the headphone outputs (2).

7. **Microphone Gain Knob (Mic Gain):** This knob controls the gain level of the Microphone input. The signal (green) LED illuminates when signal is present at the microphone input (i.e., incoming audio signal is greater than -20dB). The peak (red) LED illuminates when incoming audio signal is clipping (distorting) and indicates that the Microphone Gain knob should be turned down.

8. **Instrument Gain Knob (Inst. Gain):** This knob controls the gain level of the Instrument input. The signal (green) LED illuminates when signal is present at the instrument input (i.e., incoming audio signal is greater than -20dB). The peak (red) LED illuminates when incoming audio signal is clipping (distorting) and indicates that the Instrument Gain knob should be turned down.

9. **Mono Button (Mono):** By default, this button affects how incoming signals from the Microphone, Instrument and Auxiliary inputs are heard through your speakers or headphones. When active, any input signal will be routed to both the left and the right side of your stereo speakers or headphones in equal amounts, making them appear centered in the stereo field.

   Note that by default, the Mono button only affects what you hear. In other words, when recording while the Mono button is active, the signals from the Microphone, Instrument, and Auxiliary inputs are still sent to your computer in separate left and right channels, meaning the Microphone will appear on the left channel and Instrument on the right channel within your recording software (the left and right channels of your Auxiliary inputs will appear in the left and right channels of your software, respectively).

   Also note that the function of the Mono button can be changed to allow incoming signals to be recorded exactly as they are heard while monitoring. See the "MONO Input Record Key" portion of the "Advanced ProKeys Sono Functions in Edit Mode" section of this User Guide for information on how to change the operation of this button.

10. **Direct Monitor Knob (Direct Monitor):** The Direct Monitor knob controls the amount of audio input signal flowing from the Microphone, Instrument or Auxiliary inputs directly to the 1/4" main outputs. This allows you to monitor your inputs with near-zero latency.

11. **Piano Reset Button (Piano Reset):** This button restores basic piano and keyboard controller functions, including resetting the Modulation wheel, Voice Volume knob, and Sustain Pedal to their default settings. This is useful in situations in which a user has changed settings of ProKeys Sono and would like to quickly return to the default state (i.e., the Local Mode setting is set to "On" and the ProKeys Sono Grand Piano sound is loaded). Pressing the Piano Reset button also sends a "MIDI Panic" sequence of commands (i.e., "All Notes Off" and "Reset All Controllers" MIDI messages) on MIDI channel 1—a useful feature if you experience "stuck" MIDI notes. For a complete list of MIDI messages that are sent when this button is pressed, see Appendix E, "Piano Reset Button."

12. **Voice Volume Knob (Voice Vol):** This is an assignable controller that, by default, controls the volume of the sounds built into ProKeys Sono. Details on how to change the function of this knob can be found in the "Knob Assignment" portion of the "Advanced ProKeys Sono Functions in Edit Mode" section of this User Guide.

13. **Reverb On/Off Button (Reverb On/Off):** This button engages the internal reverb effect of ProKeys Sono, adding the effect to the internal keyboard sounds of ProKeys Sono. The reverb depth can be controlled via MIDI CC commands. See the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide for more information on this.

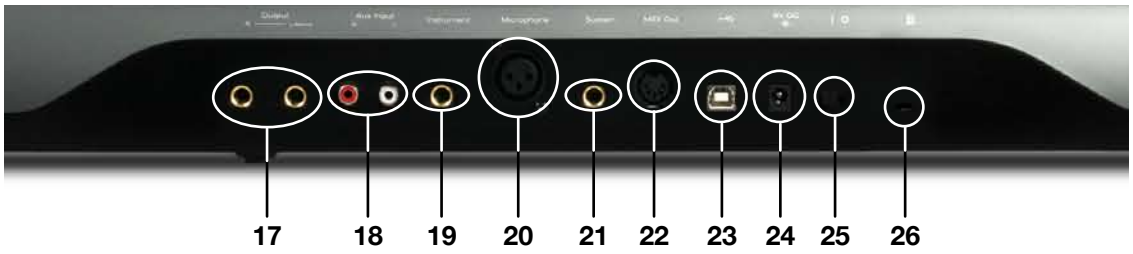
14. **Chorus On/Off Button (Chorus On/Off):** This button engages the internal chorus effect of ProKeys Sono, adding the effect to the internal sounds of ProKeys Sono. The chorus depth can be controlled via MIDI CC commands. See the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide for more information on this.

15. **Voice Select Buttons:** These buttons let you select which of the seven high-quality sounds is played by the ProKeys Sono keyboard.

    Pressing two buttons simultaneously allows two voices to be layered and played at the same time. Additional information on Layer Mode can be found in the "Layer Mode" portion of the "ProKeys Sono as a Standalone Instrument" chapter of this User Guide.

16. **Keyboard:** ProKeys Sono features 88 full-size, semi-weighted, velocity-sensitive keys.

Rear Panel Descriptions:



17. **1/4" Main Outputs (Output R–L/Mono):** Connect these unbalanced tip-sleeve (TS) main outputs to your mixer, powered speakers, or amplifier. These jacks output a mixed signal consisting of the ProKeys Sono internal piano sounds, signal from all of the keyboard's inputs (mic, instrument, and auxiliary), and audio signal coming from your computer. If you are connecting to a mono (single channel) device or amplifier, use the left 1/4" output.
18. **Auxiliary RCA Inputs (Aux Input R–L):** These line-level RCA-type inputs can receive signal from a variety of sources such as mixers, CD players, or drum machines. These inputs are mixed into the outputs of ProKeys Sono and will be heard on the 1/4" main outputs (17) or headphone outputs (2).
19. **1/4" Instrument Input (Instrument):** This unbalanced tip-sleeve (TS) connector allows you to connect an instrument, such as an electric guitar or bass. Use the Instrument Gain knob (8) to control the gain level of this input.
20. **XLR Microphone Input (Microphone):** This input accepts a dynamic microphone connected via a standard three-pin balanced XLR cable. Use the Microphone Gain knob (7) to control the gain level of this input.

> ***TIP**: The ProKeys Sono Auxiliary inputs do not have an input gain knob. Therefore, the volume of these inputs must be adjusted at the source to ensure that the incoming signal does not clip (distort) at the ProKeys Sono input. For example, if you have connected a CD player to the RCA inputs, you may need to adjust the output volume of the player itself to ensure distortion free recordings.*

21. **Sustain Pedal Jack (Sustain):** Connect an optional sustain pedal to this jack. This pedal is normally used for sustaining the sound you are playing without having to keep your hands on the keyboard (just like the sustain pedal on a piano).
22. **MIDI Out Jack (MIDI Out):** ProKeys Sono can connect to external MIDI devices such as synthesizers or sound modules through this jack. By default, MIDI data generated by playing the keys on the keyboard is sent to this MIDI output jack. However, it is possible to configure ProKeys Sono to act as a USB to MIDI interface, allowing MIDI data from your computer to be sent out of this jack. See the "MIDI Out Mode Key" section of the "Advanced ProKeys Sono Functions in Edit Mode" chapter for more information.
23. **USB Port (⇠⇢):** Use the provided USB cable to connect ProKeys Sono to an available USB port on a PC or Macintosh computer. This USB connection will power ProKeys Sono and allow transfer of audio and MIDI data between your computer and the device. Alternatively, an optional USB-type power supply can be connected to this port for standalone operation.
24. **DC Power Supply Port (9V DC):** Connect an optional 9V DC >500mA center-positive power supply to this jack when using ProKeys Sono in standalone mode. This port does not need to be used when ProKeys Sono is connected to your computer with a USB cable or if a USB-type power supply is being used.
25. **On/Off Switch (I / O):** This On/Off switch turns ProKeys Sono on and off.
26. **Kensington® Security Slot ( ):** This slot is compatible with Kensington® security cables to protect your device from theft.

Powering ProKeys Sono:

ProKeys Sono can be powered through either the USB port or the DC Power Supply port. It is NOT necessary to power the device through both ports. For example, if ProKeys Sono is connected to your computer using the USB cable, it is not necessary to use a DC power supply.

Hardware Connections

Audio Inputs

A dynamic microphone can be connected to the XLR input on the rear panel of the keyboard, while an instrument such as a guitar or bass can be connected to the 1/4" input jack next to the XLR input. Each of these two inputs has an independent preamp with its own gain control knob, and signal/clip LEDs. Two RCA Auxiliary inputs are also located on the back panel. Signal from these inputs is mixed with the Microphone and Instrument inputs before being routed through the USB connection to a connected Mac or PC.

Audio Outputs

Connect the two 1/4" main outputs on the rear panel to powered monitors, an amplifier, or a mixer. You may also monitor through headphones by connecting one or two sets of headphones to the 1/4" stereo headphone outputs on the front panel.

MIDI Connections

In addition to the USB MIDI connection between ProKeys Sono and your computer, you can connect the MIDI Out jack of ProKeys Sono to an external device's MIDI input. This allows you to control an external synthesizer or sound module by either using ProKeys Sono as a standalone MIDI controller keyboard or by sending your sequencing application's MIDI data to the hardware device through the keyboard (i.e., using ProKeys Sono as a USB to MIDI interface).

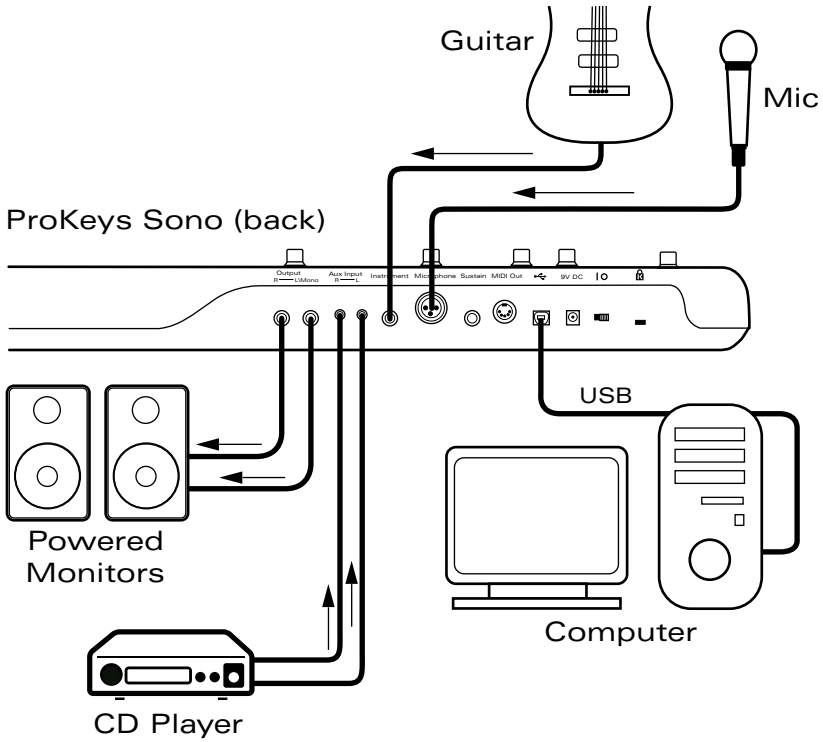
Note that the ProKeys Sono "MIDI Out Mode" setting must be configured correctly for your sequencing application's MIDI output signals to appear at the MIDI output jack on the back of ProKeys Sono. Please see the section entitled "MIDI Out Mode Key" in the "ProKeys MIDI Output Settings" chapter to find out more about this setting.

Other Connections

A sustain pedal can be connected to the 1/4" Sustain pedal jack on the back of the keyboard.

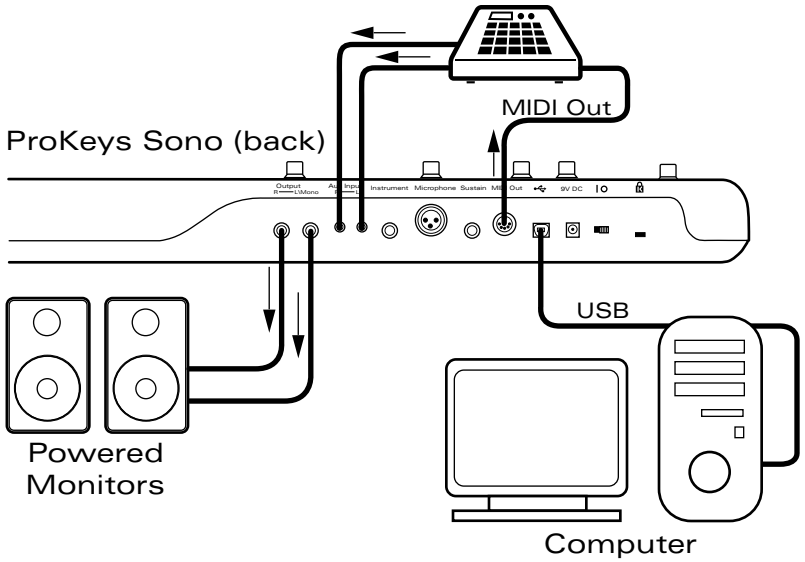
Example Operating Scenarios

The following diagrams illustrate two scenarios in which ProKeys Sono is connected to external hardware.



Example Setup #1

Example Setup #1 shows M-Audio ProKeys Sono with a microphone connected to the Microphone input, and an electric guitar plugged into the Instrument input. A CD player is connected to the auxiliary inputs. The main outputs of ProKeys Sono are connected to a monitoring system (powered speakers, in this case) while a computer powers the keyboard through the USB connection. A sequencing application on the computer handles all incoming and outgoing audio and MIDI data. This is covered in greater detail in the "Using ProKeys Sono with a Computer" section of this guide.



Example Setup #2

Example Setup #2 shows a drum machine plugged into the Aux inputs, and the ProKeys Sono main outputs plugged into a pair of powered speakers. The ProKeys Sono MIDI Output jack is connected to the MIDI input of the drum machine, while a sequencing application on a computer handles audio and MIDI data through the USB connection (see "Using ProKeys Sono with a Computer" to learn more about how your ProKeys Sono and computer exchange audio and MIDI data).

This setup allows you to:

1. Send MIDI information from either the ProKeys Sono keyboard or your computer's sequencer to the drum machine.
2. Return the audio output of the drum machine into ProKeys Sono, where it can be mixed with the built-in sounds and/or audio coming from the computer.
3. The mixed output is then sent to powered speakers (or headphones) for monitoring.

About the audio inputs:

Keep in mind that ProKeys Sono features a 2-input, 2-output audio interface. This means that while ProKeys Sono has a variety of analog inputs on its rear panel (i.e., an XLR microphone input, a 1/4" instrument input, and a pair of RCA Aux inputs), the XLR/Left Aux and Instrument/Right Aux inputs are merged (or "summed") together before being sent to the computer. In other words, if signal is present at all of the inputs when you begin recording, the XLR and Left Aux will appear mixed together in channel one of your software while the Instrument and Right Aux inputs will appear mixed together as channel two.

Note that by default, the built-in ProKeys Sono sounds are also summed with the microphone, instrument, and auxiliary inputs and sent to the computer for recording. If you do not wish to send the ProKeys Sono sounds to your music software, this can be accomplished by toggling the USB Record switch in Edit mode. Additional information on this can be found in the "USB Record Key" portion of the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide.

Similarly, while ProKeys Sono features two sets of headphone outputs and 1/4" main outputs, all of these outputs play the same stereo signal.

ProKeys Sono as a Standalone Instrument

Standalone operation refers to using ProKeys Sono without a computer. To do this, an optional USB-type power supply or 9V, 500mA center-positive power supply (sold separately) is required.

> ***NOTE**: While ProKeys Sono can receive power from two different power sources, the device only requires one power source to operate. In other words, if one type of power supply is connected (such as a USB-type power adapter), it is not necessary to connect the second type of power supply (the 9V, 500mA adapter).*

ProKeys Sono can function as a standalone instrument, providing seven premium voices, and a complete General MIDI (GM) sound set. In addition to playing the built-in sounds, you can use the keyboard to trigger sounds on synthesizers or sound modules that are connected to the MIDI Out jack on ProKeys Sono. By default, ProKeys Sono transmits MIDI data on channel one.

You can also use the Mic Gain, Instrument Gain, Direct Monitor and Voice Volume knobs in standalone mode to create a mix of your keyboard, guitar and vocal performances.

ProKeys Sono Premium Voice Selection

The seven premium voices can be accessed via the Voice Select buttons on the top panel. Pressing one of these buttons activates the corresponding sound.

Layer Mode

ProKeys Sono features a "Layer" Mode that allows you to play two of the built-in premium voices in unison. To do this, press and hold one Voice Select button to select the primary voice, followed by a second Voice Select button (the secondary voice).

Note that when using Layer mode, the "secondary" premium voice plays slightly softer than the "primary" voice.

You can exit layer mode by pressing a single Voice Select button."

Layer mode can also be used in conjunction with externally connected MIDI devices.[5] When Layer mode is engaged, ProKeys Sono will continue to send MIDI messages on MIDI channel one, but will also transmit the same MIDI notes on channel two for the second, layered voice. In this scenario, the second voice is transmitted at lower volume.

> ***Tip**: When Layer mode is active, the same "two-channel" MIDI information is also transmitted to a connected computer via USB. It is possible to create layered sound effects by using two software synthesizers in place of an external MIDI synthesizer. Please consult your software application's manual for information on configuration and MIDI routing.*

Configure your external synthesizer to receive MIDI information on MIDI channels one and two and make sure the two channels are routed to different instrument sounds. Playing the keyboard will now create a layered sound effect, using your external synthesizer.

[5] A multi-timbral MIDI device (e.g., a device that is capable of playing more than one sound at the same time) is required.

> ***Note**: If ProKeys Sono is configured to transmit MIDI messages on a channel other than the default channel (one), then note information for the secondary voice will be transmitted on the next higher MIDI channel. (e.g. first voice = channel three; second voice = channel four).*
>
> *The following exceptions apply:*
>
> - *If the main MIDI transmit channel is nine, then the secondary transmit channel will be 11. Channel 10 is reserved for drum sounds in accordance with the General MIDI specification.*
> - *If the main MIDI transmit channel is 16, then the secondary transmit channel will be 15 since there are only 16 MIDI channels in total and it is not possible to select a higher channel.*

ProKeys Sono GM sound selection

The ProKeys Sono keyboard has a full General MIDI (GM) sound set with 128 sounds built-in. The built-in GM sounds can be accessed in two ways:

***Method 1**: Recall a specific General MIDI instrument in Edit mode*

Appendix A lists the built-in General MIDI instruments by their sound numbers. Access a specific instrument by entering its number in Edit mode:

1. Press the Edit Mode button.
2. Press the black key above F6 (F#6), representing "Program."
3. Enter the desired program number, using the white keys between G5 and B6.
4. Press C7 (Enter) to confirm the selection.

***Method 2**: Browse General MIDI instruments using the Data buttons*

Reassigning the Data buttons to send program change messages will allow you to step through and audition the built-in General MIDI sounds in consecutive order. To configure the Data < > buttons to send program change messages:

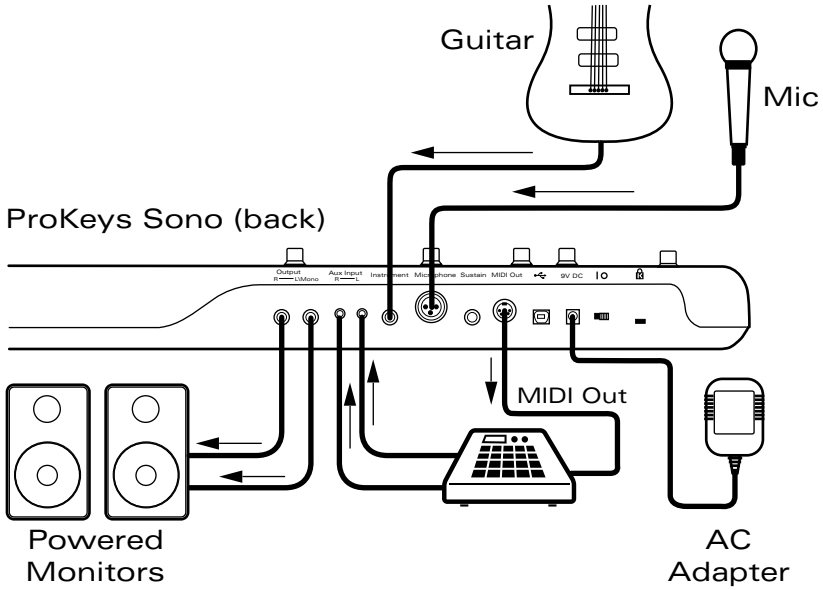
1. Press the Edit Mode button.
2. Press the black key above F3 (F#3). (ProKeys Sono will automatically exit Edit mode).
3. Press the Data > and < buttons to step forward and backwards through the built-in GM sounds.

To return the Data keys to control the transpose value:

1. Press the Edit Mode button.
2. Press the black key above D3 (D#3), representing "Data = Transpose." (ProKeys Sono will automatically exit Edit mode).

For additional information on program changes, see the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide.

ProKeys Sono as a Standalone Microphone Preamplifier and Mixer



ProKeys Sono can function as the centerpiece of a simple live performance setup.

Connect a Microphone and an Instrument (such as an electric guitar or bass) to ProKeys Sono and use the Microphone and Instrument gain knobs to set the input levels. Next, use the Direct Monitor knob to set the overall level of the microphone and instrument inputs in the mix. Finally, adjust the level of the keyboard's built-in sounds by using the Voice Volume knob.

If you connected the line outputs of an external device to the aux inputs of ProKeys Sono, the volume level of that device may need to be adjusted at the external device itself.

The mixed signal of Microphone, Instrument, Aux input and built-in sounds will be available on both headphone outputs and the rear-panel 1/4" outputs.

Use the Master Volume slider to adjust the overall output level.

***Tip**: Connect the MIDI Out jack of ProKeys Sono to an external MIDI synthesizer or sound module. Connect the Line outputs of the external device to the Aux inputs on ProKeys Sono. If you play the ProKeys Sono keyboard, you will trigger MIDI sounds on the external MIDI synthesizer, and can hear them back through the ProKeys Sono main outputs.*

***NOTE**: ProKeys Sono is capable of many advanced features which can be accessed via the ProKeys Sono Edit mode. Many of these features can be useful when ProKeys Sono is operating in Standalone mode. Additional information concerning these features can be found in the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide.*

ProKeys Sono Demos

ProKeys Sono has a built-in demo song for each instrument sound. To hear these demos:

1. Press the Edit Mode button.
2. Press one of the Voice Select buttons.

Demo playback can be stopped by pressing the Edit Mode button. While the demo is playing, the LED of the selected voice will flash. At the completion of the demo, the demo song will repeat.

Basic ProKeys Sono Setup in Windows

Information on Windows driver installation can be found in the included printed Quick Start Guide.

Your computer will recognize ProKeys Sono without the need to install the M-Audio driver software. However, M-Audio recommends installing the device drivers for improved audio performance and to gain access to additional professional features such as:

- **Low latency software monitoring:**

  Low latency software monitoring allows you to play software synthesizers and monitor audio input through your recording software with minimal delay between an action (e.g. pressing a key, strumming a chord, or singing a note) and hearing the resulting sound on your speakers or headphones.

- **Multi-client MIDI operation:**

  This feature allows you to use ProKeys Sono as a MIDI input and output device with more than one application at the same time.

- **Support of large System Exclusive (SysEx) transfers:**

  Transmit large SysEx files (e.g. all parameters of every sound on an external synthesizer, stored within a single file) to connected Synthesizers or other MIDI devices.

- **Pro Tools M-Powered support:**

  Use ProKeys Sono as an audio interface with a qualified version of the Pro Tools M-Powered production software.

  If you do not require any of the above listed features, you can simply connect ProKeys Sono to your Windows computer and begin using it without the need to install additional driver software.

Windows XP/Vista users: Important information for class-compliant operation

IMPORTANT*: When using ProKeys Sono class-compliant (i.e., without installing drivers) in Windows, the computer will search for the M-Audio DFU (device firmware upgrade tool) and display a Found New Hardware Wizard. The M-Audio DFU is a component of ProKeys Sono 88 that is enabled when the M-Audio drivers are installed, but is not necessary for class-compliant operation. You have the following options:*

A*. Cancel the Found New Hardware Wizard and start using ProKeys Sono immediately.*

The Found New Hardware Wizard will appear every time your computer detects that the device is connected (e.g. upon restarting the computer or disconnecting/reconnecting ProKeys Sono).

B*. Follow the Found New Hardware Wizard until it gives the option not to be prompted to install this hardware again.*

Windows Vista Users:

- *Select "Don't show this message again for this device" in the first screen that appears.*
- *Click "Continue" in the confirmation screen that follows.*

Windows XP Users:

- *In the first screen, select "No, not this time" and click "Next"*
- *In the second screen, select "Install the software automatically" and click "Next"*
- *Finally, make sure the check box labeled "Don't prompt me again to install this software" is active, then click Finish.*

C*. Install the M-Audio drivers as described in the "Driver Installation for ProKeys Sono 88" section of the Quick Start Guide. After these drivers have been installed, the Found New Hardware Wizard for the M-Audio DFU will no longer be displayed.*

ProKeys Sono Setup in Mac OS X

Your computer will recognize ProKeys Sono without the need to install the M-Audio driver software. However, M-Audio drivers need to be installed if you are planning to use ProKeys Sono with a qualified version of the Pro Tools M-Powered music production software.

> ➜ ***IMPORTANT**: Disconnect ProKeys Sono from your computer until the appropriate driver files have been copied to your hard drive. The instructions will indicate when the keyboard should be connected to your computer.*

1. We recommend that you download the most recent drivers by going to the Support > Drivers page at www.m-audio.com. This ensures that you have the newest drivers available. If you do not have Internet access, insert the M-Audio ProKeys Sono Drivers and Documentation CD-ROM into your computer to install the drivers that came with the keyboard.

   a. If you are installing drivers from the M-Audio ProKeys Sono Drivers and Documentation CD-ROM, a CD-ROM icon will appear on your desktop once the disc is inserted into your computer. Double-click this icon to view the contents of the disc. Next, double-click "Open Me." Finally, select your product from the drop-down menu on the welcome screen and click "Install."

   b. If you are installing drivers from www.m-audio.com, the downloaded file should automatically mount and display its contents. If this file does not automatically mount after it has finished downloading, click on the file from the download stack (Mac OS X 10.5), or double-click the file from the desktop (Mac OS X 10.4) to display its contents. Next, double-click the installer application.

2. Follow the driver installer's on-screen instructions. During Installation, Mac OS X will ask you to enter your user name and password. Enter this information and click OK to confirm. If you have not configured a password for your computer, leave the password field blank and click OK. If you are not the computer's owner, ask the owner or your Administrator for the missing information.

3. When the installer has completed, click "Restart." Your computer will reboot automatically.
4. After your computer has finished starting up, connect ProKeys Sono to an available USB port on your computer. The single USB cable not only powers the keyboard but also transfers MIDI and audio data to and from your computer system.

ProKeys Sono is now ready to use.

Using ProKeys Sono with a Computer

ProKeys Sono provides an array of features, and a multitude of possibilities when used in conjunction with recording software on your computer. As described earlier in this guide, ProKeys Sono combines the functionality of several devices in one single product. These features can interface with computer software in many different ways. Recording software typically provides different types of tracks, allowing you to harness the various features of ProKeys Sono.

ProKeys Sono transmits two types of data: Audio and MIDI. Audio is the same type of data that we encounter in our daily lives when we turn on the radio, or television and hear the resulting sound. Audio is the signal that is sent from microphones and instruments such as electric guitars and basses to speakers or amplifiers.

On the other hand, the MIDI protocol consists of messages that are used to control synthesizers, sound modules, keyboards, or "virtual instruments" found within computer software. These MIDI data messages give instructions on how a sound should play. These instructions dictate parameters such as what note to play, when to play it, how loud to play it, and which sound to use.

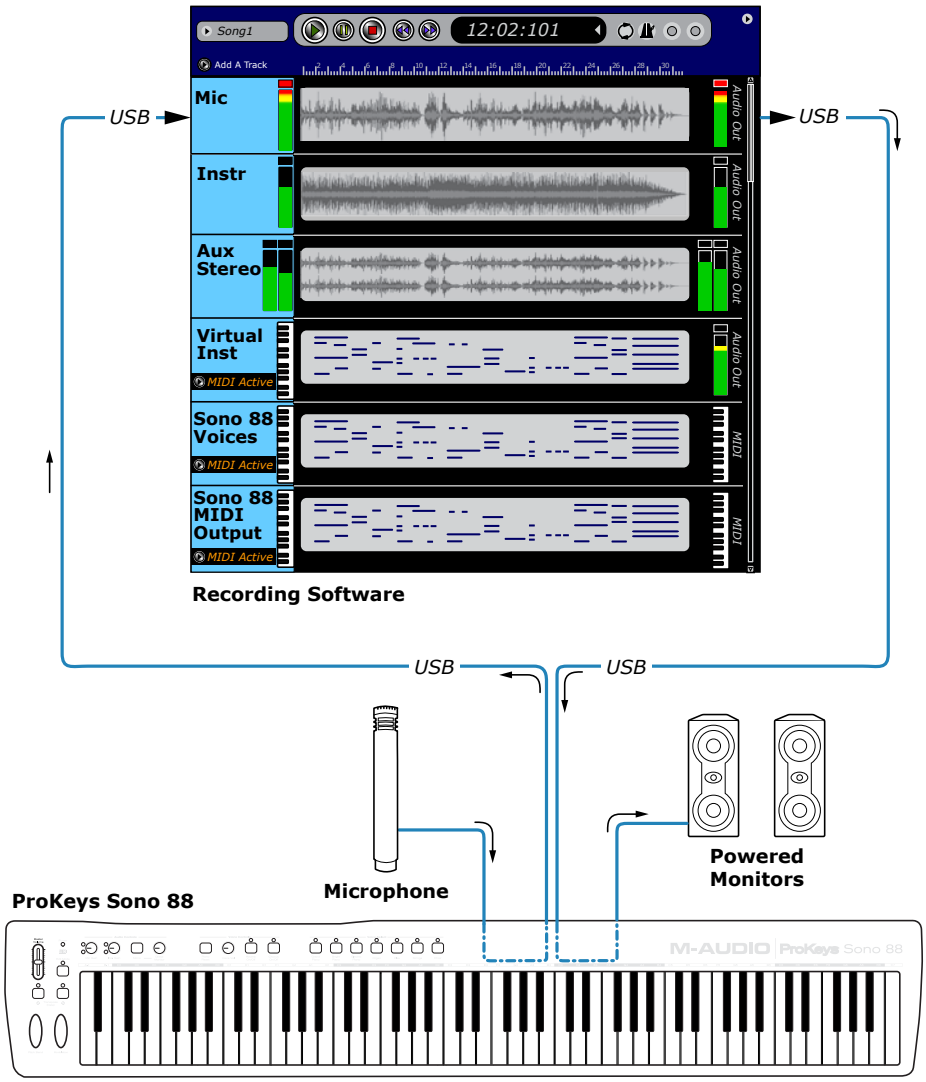
The examples on the following pages will examine various recording scenarios by looking at a generic recording/sequencing application and how it handles audio and MIDI data on separate track types.

Audio Tracks:

Audio tracks allow recording and playback of audio that originates from the Microphone, Instrument or Aux inputs. Audio tracks within your computer software can also be used to record the built-in voices of ProKeys Sono as audio. Once an audio recording is made, you can apply effects or edit the recording by cutting or copying parts of the recording. However, the general sound of the recording is fixed if recorded using audio tracks, and cannot easily be changed.

> ***NOTE**: The following examples make use of software-based monitoring. Software monitoring allows you to hear your signals after they have passed through the recording software. ProKeys Sono also features a Direct Monitor knob (10) that allows you to listen to input signals directly on the main outputs, without passing the signals through your audio software. This feature is covered in the "Using Direct Monitoring" section of the "ProKeys Sono Audio Setup and Controls" chapter.*

Recording from a Microphone to an Audio Track



In this scenario, ProKeys Sono is being used as an audio interface to record a microphone:

The microphone's output signal is received at the microphone (XLR) input jack on ProKeys Sono and sent to the computer through the USB connection. Sequencer software running on the computer can then capture the microphone signal on one of its mono audio tracks (the track is labeled "Mic" in the illustration above).

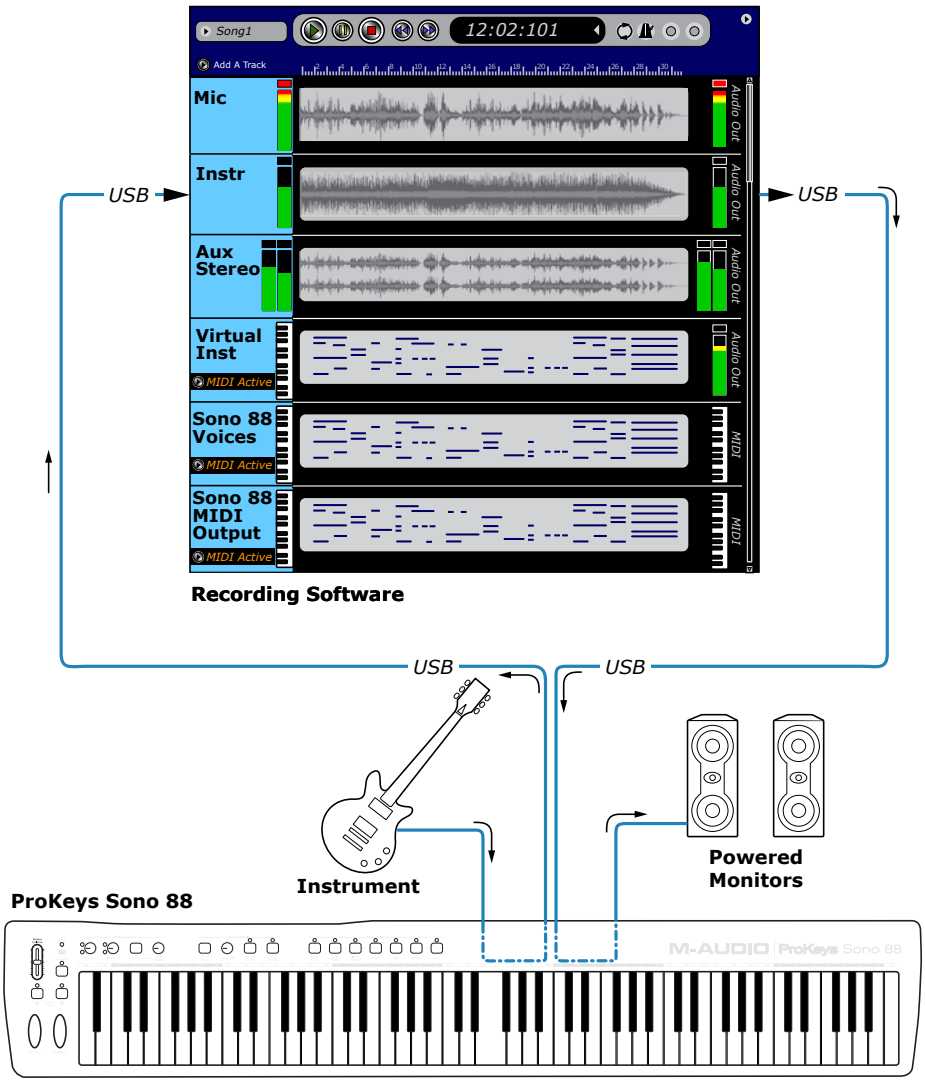
This signal can be monitored while recording or played back after it has been recorded. Monitoring can take place over powered speakers (connected to the 1/4" main output jacks on the rear panel) or by headphones (connected to either one of the 1/4" headphone jacks on the front panel).

Keep in mind that–depending on how the Mono button is configured to function–the microphone input routing can be altered to make the microphone appear on both channels (one and two) of a stereo track (i.e., "centered" in the stereo field). This functionality may be helpful in direct monitoring situations where headphones are being used. To learn more about this, see the section titled "The Mono Button" within the "ProKeys Sono Audio Setup and Controls" section of this User Guide.

***TIP**: Signal from the ProKeys Sono microphone input is usually available on input channel one within your recording software. To record from a microphone, this mono audio track must be configured to receive signal from audio input channel one. See your audio application's documentation to learn how to configure an audio track.*

***TIP**: When recording with a microphone in your studio, it is recommended that you turn off your speakers and monitor through headphones. This prevents feedback loops which may be very loud and can damage your equipment or harm your hearing.*

Recording an Instrument to an Audio Track



Like the previous scenario, ProKeys Sono is being used as an audio interface. However, this time the instrument input is being used to record an electric guitar (or bass) into your computer.

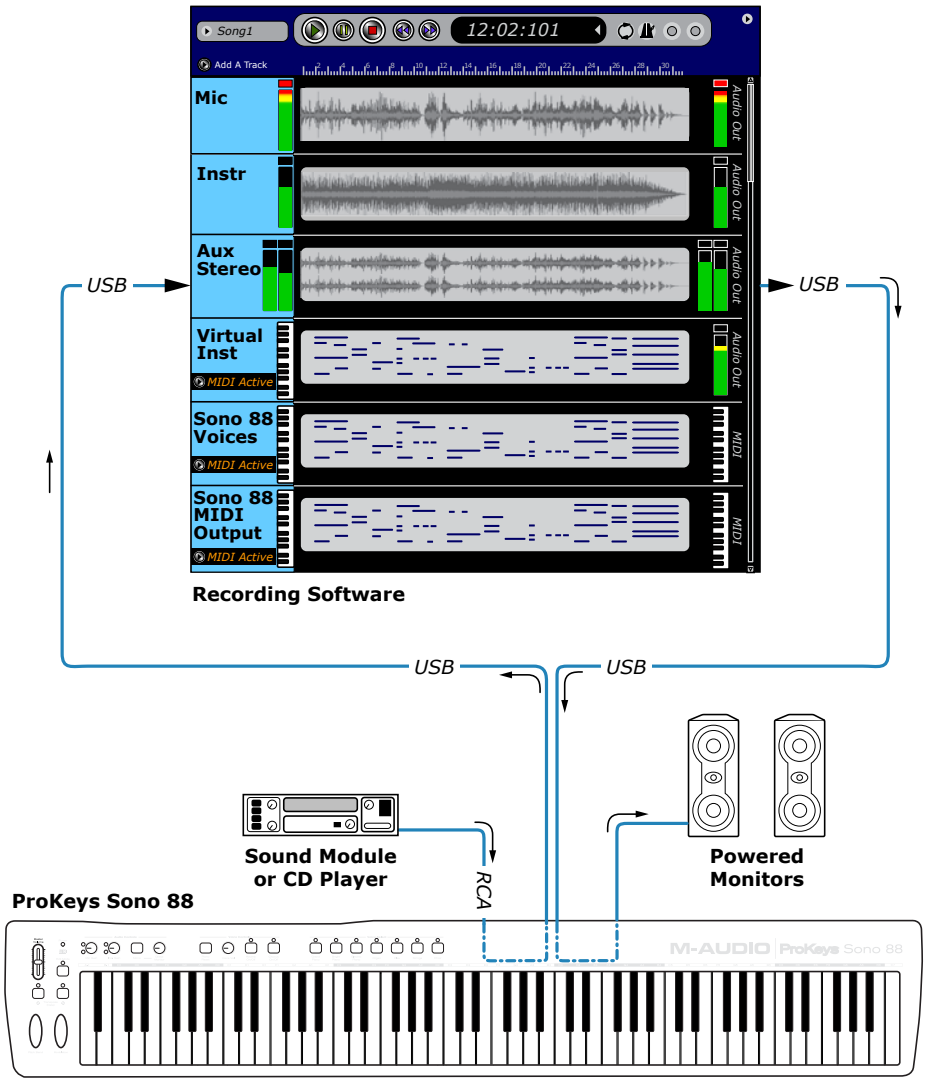
The guitar's output signal is received at the 1/4" instrument input jack on ProKeys Sono and sent to the computer through the USB connection. Sequencer software running on the computer can then capture the guitar's signal on one of its mono audio tracks (the track is labeled "Instr" in the illustration above).

This signal can be monitored while recording or played back after it has been recorded. Monitoring can take place over powered speakers (connected to the 1/4" main output jacks on the rear panel) or by headphones (connected to either one of the 1/4" headphone jacks on the front panel).

Keep in mind that–depending on how the Mono button is configured to function–the instrument input routing can be altered to make the instrument appear on both channels (one and two) of a stereo track (i.e., "centered" in the stereo field). This functionality may be helpful in direct monitoring situations where headphones are being used. To learn more about this, see the section titled "The Mono Button" within the "ProKeys Sono Audio Setup and Controls" section of this User Guide.

***TIP**: Signal from the ProKeys Sono instrument input is usually available on input channel two within your recording software. To record the instrument's output, this mono audio track must be configured to receive signal from audio input channel two. See your audio application's documentation to learn how to configure an audio track.*

Recording the Aux Inputs to an Audio Track



Once again, ProKeys Sono is being used as an audio interface. However, in this scenario, the auxiliary input jacks are being used to record the output of an external device (such as a sound module, CD player, or other line-level device).

The external device's stereo output is received at the RCA input jacks on ProKeys Sono and sent to the computer through the USB connection. Sequencer software running on the computer can then capture the device's signal on a stereo audio track (labeled "Aux Stereo" in the illustration above). Signal entering the left Aux input is routed to the left channel of your software (i.e., channel one) while the right Aux input is routed to the right channel (channel two) of the recording software.

This stereo signal can be monitored while recording or played back after it has been recorded. Monitoring can take place over powered speakers (connected to the 1/4" main output jacks on the rear panel) or by headphones (connected to either one of the 1/4" headphone jacks on the front panel).

***TIP**: Signal from the ProKeys Sono auxiliary inputs are usually available on input channels one and two within your recording software. To record the external device's outputs, a stereo audio track must be configured to receive signal from audio input channels one and two. See your audio application's documentation to learn how to configure an audio track.*

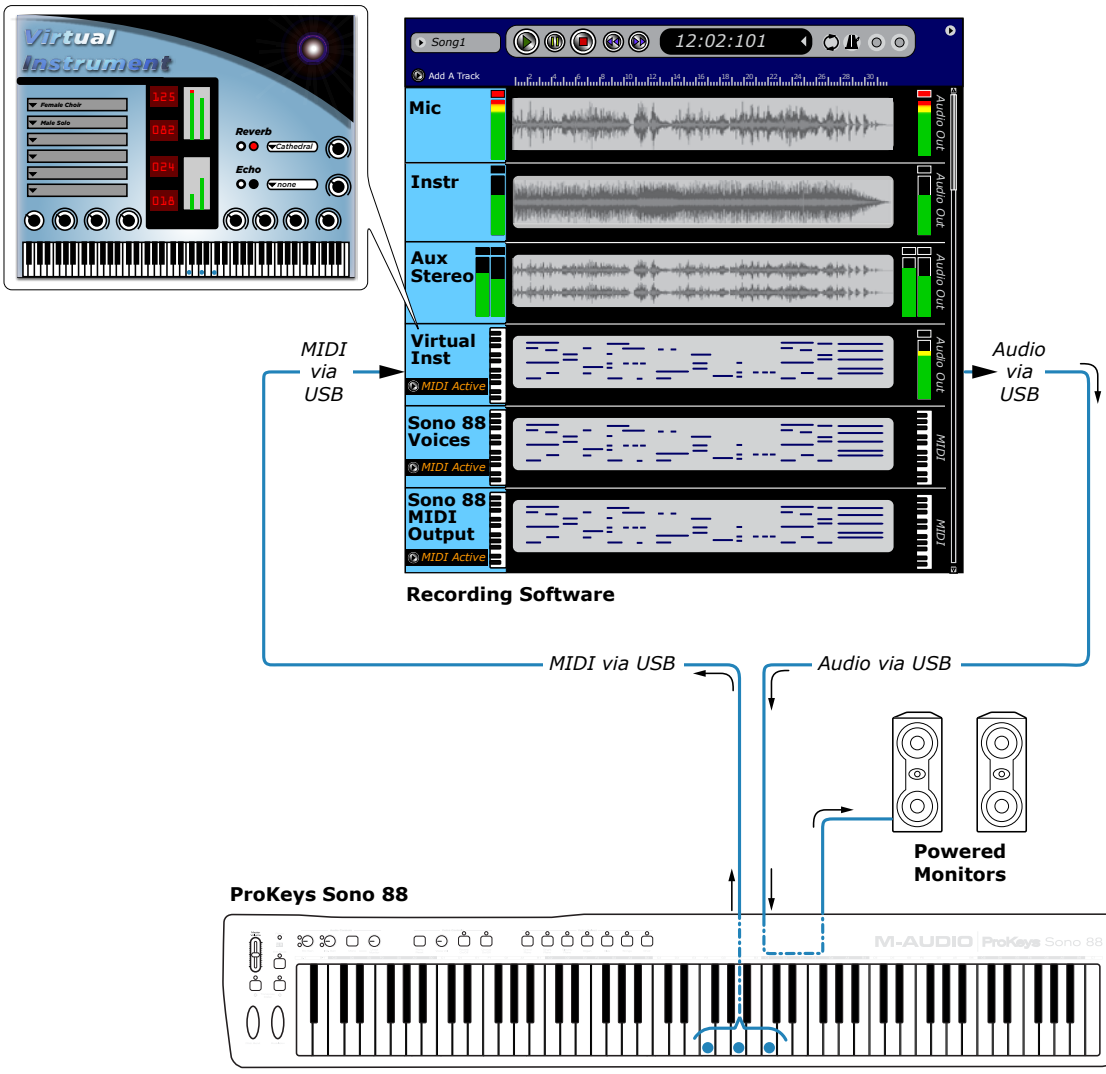
Keep in mind that–depending on how the Mono button is configured to function–the routing of the auxiliary inputs can be altered to make the left and right channels appear as a mono sound source that is "centered" in the stereo field. This functionality may be helpful in direct monitoring situations where headphones are being used. To learn more about this, see the section titled "The Mono Button" within the "ProKeys Sono Audio Setup and Controls" section of this User Guide.

MIDI Tracks:

MIDI tracks allow you to record the notes you play on the ProKeys Sono keyboard as MIDI data. The benefit of using MIDI tracks is that nearly every aspect of each recorded note can easily be changed. For example, you can change the pitch, duration or even the instrument sound after a recording has been made. However, you always need to have a MIDI instrument available in order to play back MIDI tracks. ProKeys Sono has a built-in sound engine that gives you 128 standardized "General MIDI" sounds (including the seven ProKeys Sono premium sounds). Additionally, you can choose to use virtual instrument software within your recording application, or connect an optional MIDI sound module to the MIDI Out jack on ProKeys Sono to give you even more sound choices.

Below, we will examine various MIDI options you have with ProKeys Sono, by looking at the different track types in a typical recording/sequencing application, and the options you have with each of them.

Recording MIDI and triggering sounds on a virtual instrument



TIP: See your software's documentation to learn more about audio/MIDI routing and virtual instruments.

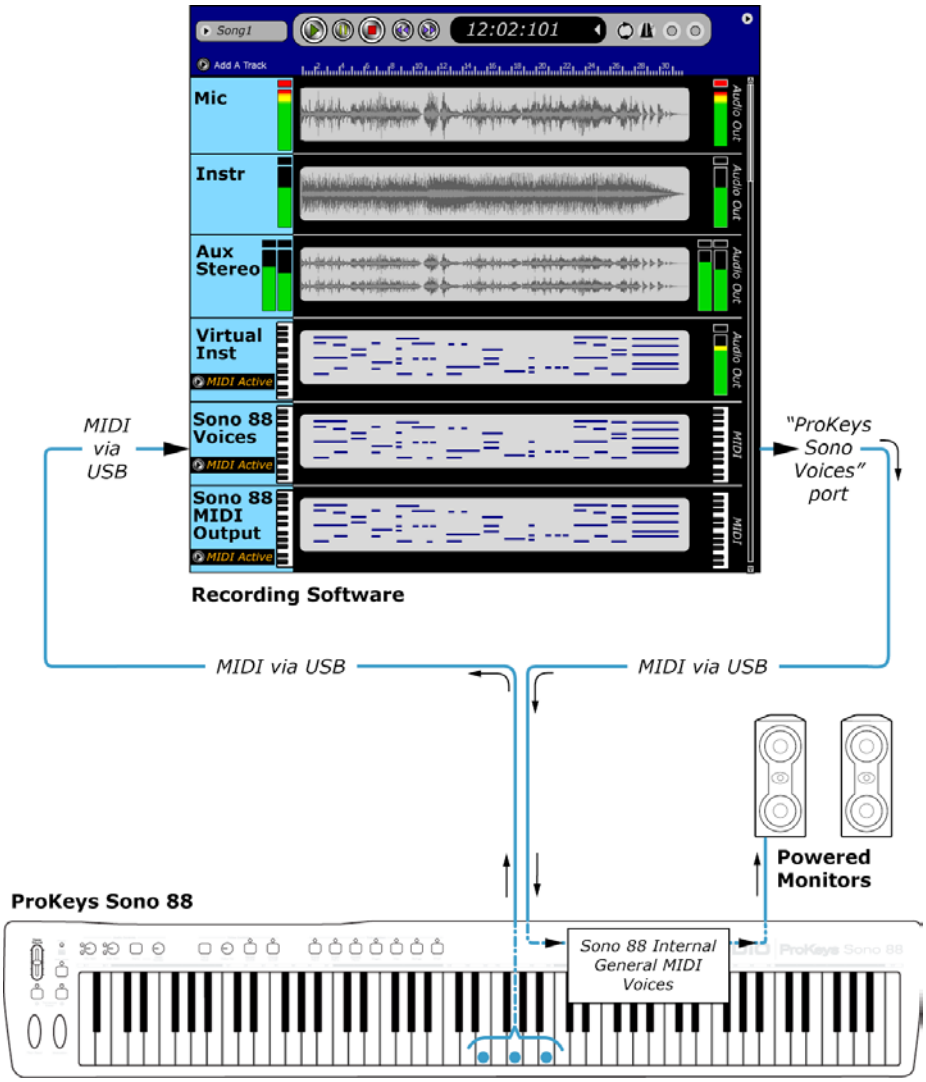
NOTE: *For additional information on routing MIDI signal from ProKeys Sono to your computer sequencing software, see the "Routing MIDI Data to your Computer" section of this User Guide.*

In this scenario, the keys, wheels, and other controls of your ProKeys Sono generate MIDI data that is sent to the computer through the USB connection. The computer's sequencing software routes this MIDI data to a virtual instrument loaded on one of its tracks. The virtual instrument receives the MIDI data and then generates audio data (sound) that is then routed to the ProKeys Sono main outputs. Monitoring can take place over powered speakers (connected to the 1/4" main output jacks on the rear panel) or by headphones (connected to either one of the 1/4" headphone jacks on the front panel).

Note that it is not necessary to select any of the two ProKeys Sono MIDI output ports[6] when working with virtual instruments. Configure your sequencing application to route MIDI signals to your virtual instrument software.

[6] *ProKeys Sono will appear as two separate MIDI output ports within your sequencing application: "ProKeys Sono MIDI Out" and "ProKeys Sono Voices" or, when using the device class-compliant in Windows XP, as "USB Audio Device" and "USB Audio Device [2]". See the section titled "Routing MIDI Signals from your Software" for more information.*

Recording MIDI and triggering the internal sounds of ProKeys Sono



***Note**: Most MIDI recording applications allow incoming MIDI signals to be recorded and simultaneously passed through to externally connected MIDI devices. If your software is configured to do this and you are working with the built-in voices of ProKeys Sono, sounds will be triggered in real-time through the recording software. However, by default ProKeys Sono also triggers its built-in sounds directly when playing the keys on the keyboard. This means that you may hear every note twice: Once since the sounds are triggered locally from the ProKeys Sono keyboard and a second time because of MIDI signals returning to ProKeys Sono from the recording application.*

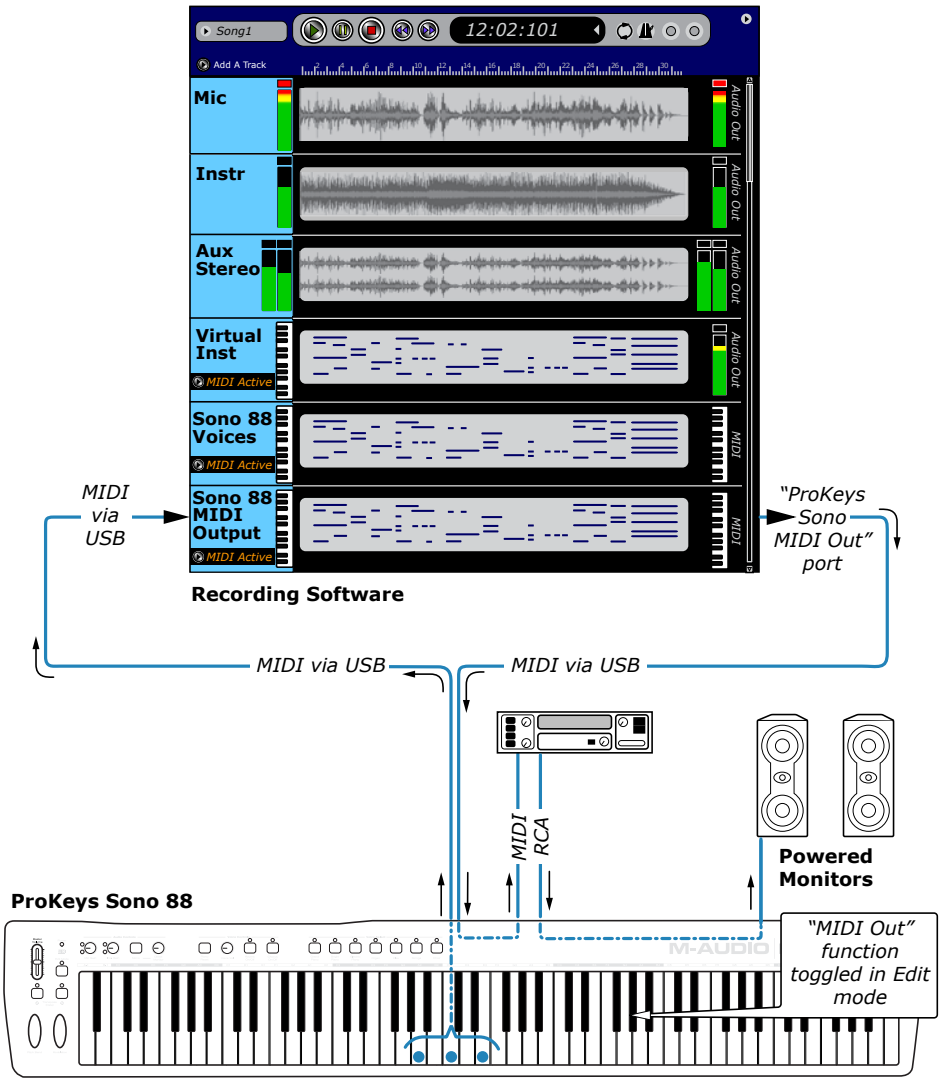
To prevent notes from being triggered twice, configure ProKeys Sono to operate in Local Off mode. See page 37 for more information on how to do this.

In this scenario, ProKeys Sono is used to record to a MIDI track within the computer's sequencing software. The MIDI data is recorded, simultaneously passed through the software, and routed back to the "ProKeys Sono Voices"[7] MIDI output port (this port connects to the sound engine of ProKeys Sono). Audio is then generated by the built-in sound engine of ProKeys Sono and sent to powered monitors through the main outputs.

➜ ***IMPORTANT**: Built-in ProKeys Sono sounds can also be recorded as audio to an audio track within your recording software. By default, sounds generated by the built-in sound engine of ProKeys Sono are merged into audio input channels one and two, mixing them with input signals from the Microphone, Instrument, and Aux inputs. The mixed signal can be recorded by your recording software. If you do not wish to send the audio signal created by playing the built-in ProKeys Sono sounds to your software audio inputs, this can be accomplished by toggling the USB Record switch in Edit mode. Additional information on this can be found in the "USB Record Key" portion of the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide.*

[7] *The order and naming of the MIDI ports may vary slightly depending on your operating system and sequencing application. If ProKeys Sono is used as a class-compliant device under Windows XP, its output ports will appear as "USB Audio Device" and "USB Audio Device [2]."*

Recording MIDI and triggering sounds on an external sound module



Like the previous scenario, ProKeys Sono is used to record to a MIDI track within the computer's sequencing software while simultaneously routing this MIDI information back to ProKeys Sono. However, instead of routing the MIDI signal back to the ProKeys Sono internal sound engine (i.e., "the "ProKeys Sono Voices" MIDI port), the MIDI signal is routed to the ProKeys Sono MIDI Out jack (i.e., to the "ProKeys Sono MIDI Out"[8] port within your software). This results in MIDI data being sent to an external MIDI sound module.[9]

The MIDI sound module receives data from the ProKeys Sono MIDI output jack and generates audio (sound) that is routed back to the RCA inputs of the keyboard. This output of the sound module can then be monitored through the headphone outputs of ProKeys Sono or via speakers connected to the 1/4" outputs (as shown above).

TIP: Follow the method described in the "Recording the Aux Inputs to an Audio Track" section of this chapter to record the output of your external sound module as audio within your recording software.

[8] The order and naming of the MIDI output ports may vary slightly depending on your operating system and sequencing application. If ProKeys Sono is used as a class-compliant device under Windows XP, its output ports will appear as "USB Audio Device" and "USB Audio Device [2]."

[9] The ProKeys Sono "MIDI Out Mode" setting must be configured correctly for your sequencing application's MIDI output to appear at the MIDI output jack on the back of ProKeys Sono. Please see the section entitled "MIDI Out Mode Key" in the "ProKeys MIDI Output Settings" chapter to find out more about this setting.

ProKeys Sono Audio Setup and Controls

Using the Microphone and Instrument Inputs

To record the microphone and instrument inputs of ProKeys Sono into your audio application:

1. Select "ProKeys Sono 88" or "USB Audio Interface"[10] as an audio input device within your application's setup menu. Please see your audio application's documentation to learn how to do this.
2. Select "ProKeys Sono 88" or "USB Audio Interface"[10] as the audio track's output within your recording software. Again, see your audio application's documentation to learn how to do this.

ProKeys Sono features high-gain, low-noise preamplifiers on its microphone (channel one) and instrument (channel two) inputs. Channel one features a low-impedance input with an XLR connector and is designed to receive the output of a dynamic microphone. Channel two has a 1/4" high-impedance instrument input and is designed to accept signals from an electric guitar, bass, or other high-impedance source. You may attach a direct box or passive transformer to the microphone input (channel 1) if you would like to plug another guitar, bass, or other high-impedance instrument into the ProKeys Sono Microphone input.

[10] **Windows XP/Vista Users:**

In Windows XP, ProKeys Sono will appear as "USB Audio Device" if the optional drivers have not been installed. If the drivers have been installed, ProKeys Sono will appear as "ProKeys Sono 88*". In Windows Vista, ProKeys Sono will appear as "ProKeys Sono 88*"regardless of whether or not the optional drivers have been installed.

*Note that the actual ProKeys Sono name displayed by the computer may vary slightly.

Setting Input Gain

The M-Audio ProKeys Sono Mic input (channel one) and Instrument input (channel two) each provide up to 35dB of gain. Microphones, electric guitars, and basses typically emit low "instrument" level signals and require preamplifiers (such as the ones in ProKeys Sono) to boost the signals before being recorded.

Plug in your microphone or instrument with the gain controls turned down. While playing your instrument or singing into the microphone at the loudest section of the song, slowly turn the gain knob clockwise until the red clip LED begins to illuminate. Then, turn the knob counter-clockwise until the clip indicator no longer illuminates. At this point, you should be ready to record with the optimum gain setting.

Please keep in mind that the red LED indicates that your input is clipping (distorting) digitally. This is not the same kind of analog-style distortion found on guitar amplifiers and stomp boxes. Digital distortion is generally considered to be harsh and unmusical and it is recommended that you use the signal/peak LEDs to avoid this type of clipping.

***Tip**: As described in the "About the audio inputs" box in the "Hardware Connections" chapter earlier in this User Guide, the XLR/Left Aux inputs and Instrument/Right Aux inputs are merged (or "summed"). As a result, if you are not using one of the inputs, be sure to turn its gain knob all the way down (fully counter-clockwise) since any possible background noise or unintended signals entering the unused input during recording may also be amplified and heard in the recording.*

Using the Aux Inputs

M-Audio ProKeys Sono has a pair of line-level inputs labeled "Aux Input." These RCA inputs are designed to accept signals from any sound source with line-level outputs (such as a synthesizer, drum machine, or CD player).

Using music software like Ableton Live Lite, you can record audio into your computer from any sources with line-level outputs (such as CD players, drum machines, etc.).

➜ ***IMPORTANT**: By default, the Aux inputs and the built-in ProKeys Sono sounds blend with the Instrument and Microphone inputs before their signals are sent to a connected computer via USB. If the Aux inputs or any of the built-in voices are used simultaneously with the Instrument and Microphone inputs, the resulting recording will be a mix of the various signals. It is not possible to separate these blended signals after a recording has been made. If you want to edit or mix the Piano, Microphone, Instrument or Aux inputs after the recording has been made, then you will need to make a recording of each of these sound sources one at a time and on separate tracks.*

***Tip**: ProKeys Sono can be configured so that its built-in instrument sounds are NOT sent to the computer via USB, and therefore will not be recorded along with signals from the audio input jacks. See the "USB Record Key" portion of the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide for additional information on this.*

***TIP**: You can also use audio applications such as Ableton Live Lite to play your MIDI files into your external synthesizer and record the output of the synthesizer back into your computer. This allows you to apply software "plug-in" effects to these tracks. To do this, MIDI sequences must be routed to an external sound module while the audio application records the analog outputs of the external MIDI module through the ProKeys Sono Aux inputs. Additional information on this can be found in the "Recording the Aux Inputs to an Audio Track" portion of the "Using ProKeys Sono with a Computer" chapter of this User Guide. After recording, you can mix those tracks with other audio tracks (such as vocals and guitar) entirely from within your computer.*

Using Direct Monitoring

When a microphone or instrument is plugged into the inputs of ProKeys Sono, its signal needs to be converted to a digital signal, which then gets sent to the computer via the USB cable. From there, the signal is sent to your music software, processed, and returned to the ProKeys Sono main outputs. This process usually takes a few fractions of a second to make the round-trip and that delay is known as "latency." Latency is not a problem when playing back music, but it can be distracting while recording your performances. To compensate for this delay, M-Audio ProKeys Sono has a feature called Direct Monitor.

Direct Monitor duplicates your incoming signal and sends one copy of the signal straight to the outputs (the other copy of the signal is sent to the computer). The signal that is sent directly to the outputs bypasses the computer altogether and has virtually no latency as a result.

The Direct Monitor knob controls how much of the direct monitor signal is sent straight to the main and headphone outputs. Use this knob to set the monitoring level of the microphone, instrument, and auxiliary inputs that you are recording relative to the audio tracks that are playing from your computer.

➜ ***IMPORTANT**: When using Direct Monitor, you will need to disable "software monitoring" in your audio application. Otherwise, you will "double monitor" your input signals—once through the Direct Monitor signal path, and again through your computer software . Disabling software monitoring varies from application to application, but it is usually done by switching off record or input monitoring in your software or muting the channels that are record enabled. See your software's documentation to learn more.*

In a typical Direct Monitor scenario, plug your microphone into the Microphone input and guitar into the Instrument input on the rear panel. Configure a mono track to record from input channel one, and a second mono track to record from input channel two. Arm (record enable) both mono tracks in your audio software and set their recording levels using the gain controls on ProKeys Sono. Next, set the Direct Monitor Level and you are ready to record. If you are recording your mic and guitar while listening to tracks already recorded in your computer, you might want to listen once before starting the actual recording in order to set your Direct Monitor Level relative to the tracks playing from your computer.

➜ ***IMPORTANT****: The Direct Monitor knob enables monitoring of all audio signals that enter any of the ProKeys Sono audio inputs. However, the ProKeys Sono outputs must be selected within your recording software in order to hear sounds created by virtual (computer software-based) MIDI instruments. Be sure "ProKeys Sono 88" or "USB Audio Device" is selected as the audio output device within your recording software, and that you have headphones connected to the headphone outputs on the front of ProKeys Sono or amplified speakers connected to the 1/4" outputs on the back of ProKeys Sono.*

The Mono Button

When the Mono button is pressed, the Microphone input sends its signal to both the left and right outputs, and the Instrument input also sends its signal to both the left and right outputs. This means that you will hear these input signals centered between both speakers (or your headphones). When this button is not pressed, the Microphone input will be sent to the Left Output and the Instrument input will be sent to the Right Output. This means that the microphone input will be panned hard left (i.e., heard only on the left speaker or headphone) while your instrument input will be panned hard right when you listen back using Direct Monitor.

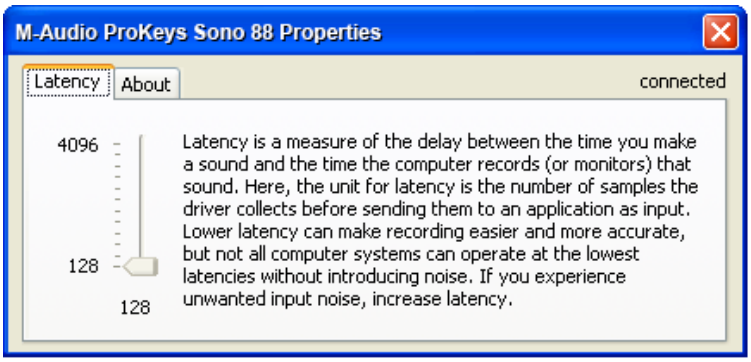
In its default state, the Mono button only affects how you hear signals from the Microphone and Instrument inputs, but does not affect how these signals are recorded. When recording to a stereo track, signal from the Microphone input will appear as input channel one (referred to as the "left input" in certain applications) whereas the instrument input appears as input channel two (the "right input"). These signals can be recorded together on to a stereo track, but it is recommended that you record the inputs on two separate mono tracks (since this will give you more control over each individual track).

Tip*: ProKeys Sono can be configured so that signals from the Microphone and Instrument inputs are recorded exactly as heard when monitoring in Mono. Enable the MONO Input Record function in Edit mode to use this feature. Once this setting has been made, the Mono button will not only affect the way you hear yourself while recording (monitoring), but also how the signal is recorded by your computer. In this scenario, if the Mono button is active and you are recording to a stereo track in your sequencing software, any mono source (such as a Microphone or a connected instrument) will be recorded to both channels of the stereo track (left and right). As a result, both, the microphone and instrument signals will appear centered between both speakers – essentially creating a two-channel mono recording. See the "Mono Input Record Key" portion of the "Advanced ProKeys Sono Functions in Edit Mode" chapter for additional information on this.*

The ProKeys Sono Audio Control Panel (Windows Only)

The M-Audio ProKeys Sono Control Panel gives you access to certain audio hardware parameters and status displays. When the ProKeys Sono drivers are installed, the Control Panel software is also installed onto your system.

The ProKeys Sono Control Panel icon ( ) appears in both the system tray (near the clock) and Windows Control Panel. Double-click the icon to open the ProKeys Sono Control Panel:


M-Audio ProKeys Sono 88 Properties
Latency
About
connected
4096
128
128
Latency is a measure of the delay between the time you make a sound and the time the computer records (or monitors) that sound. Here, the unit for latency is the number of samples the driver collects before sending them to an application as input. Lower latency can make recording easier and more accurate, but not all computer systems can operate at the lowest latencies without introducing noise. If you experience unwanted input noise, increase latency.

Latency

Latency is defined as the time it takes for audio to pass through your computer and appear at the outputs of ProKeys Sono. This parameter also adjusts the amount of latency when using "virtual instrument" software on your computer. Please see your virtual instrument software's documentation to learn more about this.

Smaller buffer sizes result in lower latency, but may not function well with slower computer systems. The Latency slider selects the buffer size that ProKeys Sono uses to handle digital audio streaming. If you notice significant latency when using ProKeys Sono, you can experiment with lower settings. If you experience stuttering or crackling in your audio playback, try using a higher latency setting.

Use the slider to adjust the buffer size to the lowest possible setting that still provides error free recording and playback.

To find your system's optimum buffer size setting, begin with a high setting and gradually reduce the size until you begin to hear clicks, pops, or other audible glitches in your audio. Then, raise the buffer size setting until these glitches disappear. You may need to stop playing audio any time you change this setting and certain applications will require you to re-launch the program before the new buffer size settings become active.

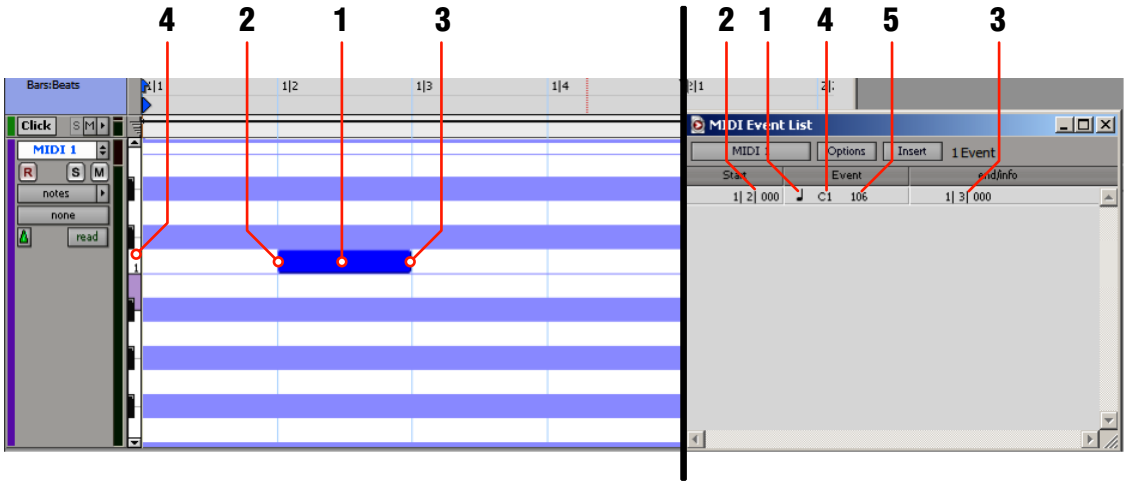
About

This tab displays the ProKeys Sono Control Panel, firmware, and driver version, and allows you to connect to the M-Audio website for updates.

Routing MIDI Data to and from your Computer

If you are new to MIDI, it may be challenging to understand how your computer and ProKeys Sono "talk" to each other using MIDI as the communication protocol. The fundamental principle to understand is that MIDI is a control protocol–a MIDI connection allows instructions to be exchanged between two devices (such as your ProKeys Sono and your computer), rather than actual audio signals (i.e. sounds). In other words, when a key is pressed on the ProKeys Sono keyboard, a MIDI instruction is sent to your computer (or hardware MIDI module) to play a specific note at a specified "velocity" (loudness). No actual audio signals are transmitted over the MIDI connection.

The following image shows an example of a typical MIDI note message as transmitted over a MIDI connection and displayed within a MIDI sequencing application after recording:



The left side of the image shows a visual representation of a recorded MIDI note in the "Piano Roll" editor of a sequencing application. For many MIDI users, working with MIDI notes that are displayed this way is more intuitive than looking at the bare MIDI data in list form as explained next.

The right side of the image shows the same note in a sequencing application's MIDI event list editor, very similar in format to how this information is transmitted over a MIDI connection.

1. MIDI event type: MIDI note
2. Start point of the MIDI note (Note On)
3. End point of the MIDI note (Note Off)
4. Pitch of the MIDI note
5. Velocity (loudness) of the MIDI note

Regardless of how MIDI information is displayed in your sequencer (visually in a piano roll editor, as traditional score within musical staff or as a MIDI event list), the recorded or transmitted MIDI information always consists of items 1-5 listed above for all MIDI notes.

MIDI instructions can be recorded by software and simultaneously routed to destinations that will transform the data into actual sound: the built-in sounds on ProKeys Sono, a virtual instrument running on the computer, or an external MIDI synthesizer. As you begin using ProKeys Sono, you will quickly discover that using a computer-based sequencer with virtual instrument software gives you access to a large array of high-quality sounds, a large graphic user interface, and the ability to edit and change performances even after they've been recorded.

Routing MIDI Signals to your Software

Most recording applications require you to select the MIDI input device that you wish to use. To do this, navigate to the appropriate MIDI setup menu within your music software and select "ProKeys Sono"[11] as the MIDI input device. The exact name and location of the MIDI setup menu varies among different sequencing applications but it is often found under the "setup" or "preferences" menu. See your specific application's documentation to learn more about MIDI input configuration.

[11] Note that the actual ProKeys Sono name displayed by the computer may vary slightly.

***Attention Windows Users**: Under Windows XP, ProKeys Sono will appear as "USB Audio Device" if the optional drivers have not been installed, and "ProKeys Sono 88" if the optional drivers have been installed. In Windows Vista, ProKeys Sono will appear as "ProKeys Sono 88" regardless of whether or not the optional drivers have been installed.*

Once ProKeys Sono is selected as the MIDI input device, most applications will automatically route MIDI data from ProKeys Sono to the record-enabled track (unless you explicitly specify a different routing). This means, you can record-enable your preferred MIDI track, start recording in your sequencer, and play your ProKeys Sono keyboard. Your performance will be recorded by the application. Refer to your sequencing application's documentation to learn more about the specifics of recording MIDI within that program.

Routing MIDI Signals from your Software

Your ProKeys Sono will appear as two separate MIDI output ports in your sequencing application. Selecting "ProKeys Sono Voices" will send your MIDI data to the ProKeys Sono internal sound engine whereas selecting "ProKeys Sono MIDI Out" will send that MIDI data to the MIDI output jack on the rear of the keyboard.[12]

Sending MIDI to the ProKeys Sono sound engine

ProKeys Sono contains a complete GM sound set containing 128 voices, seven of which are the ProKeys Sono premium-quality voices. Select:

- "ProKeys Sono 88" or "USB audio device" as the MIDI output hardware device within your recording software's MIDI setup options.
- "ProKeys Sono Voices" or "USB audio device" as the MIDI output port of the specific MIDI track you're using within your recording software.

This configuration allows you to route MIDI data from your computer to the premium voices and GM sounds on ProKeys Sono. Consult your software's documentation for instructions on how to configure the software for use with MIDI instruments that contain built-in sounds (such as ProKeys Sono).

***NOTE**: Connect headphones or powered speakers to the ProKeys Sono main outputs. Sounds created by ProKeys Sono and from software used with it will be available at the main outputs on ProKeys Sono (not on the outputs of your computer's built-in soundcard).*

Sending MIDI to an external MIDI device connected to ProKeys Sono

If you would like to send MIDI data to an external MIDI device connected to ProKeys Sono: Select:

- "ProKeys Sono 88" or "USB audio device" as the MIDI output hardware device within your recording software's MIDI setup options.
- "ProKeys Sono MIDI Out" or "USB audio device [2]" as the MIDI output port of the specific MIDI track you're using within your recording software.

*[12] **IMPORTANT**: If you are sending data to the "ProKeys Sono MIDI Out" port, the ProKeys Sono Edit Mode function "MIDI Out" must be configured to allow your sequencer's MIDI data to be sent out of the MIDI output jack. By default, the MIDI output jack on the rear of the keyboard only receives data generated by playing the ProKeys Sono keyboard directly, and does not receive MIDI data coming from your computer's sequencing application via USB.*

The operation of MIDI Out mode can be toggled by following the instructions found in the "MIDI Out Mode Key" portion of the "Advanced ProKeys Sono Functions in Edit Mode" chapter of this User Guide.

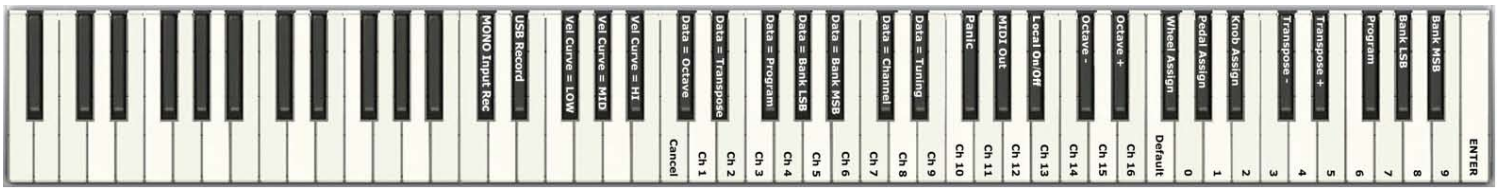
Advanced ProKeys Sono Functions in Edit Mode

The button to the left of the keys, labeled "Edit Mode," is used to access additional functions of the keyboard. When this button is pressed, the keyboard enters Edit mode and the LED above the Edit mode button illuminates. If this button is pressed again, the keyboard exits Edit mode (the Edit mode button LED turns off) and regular operation is resumed.

When in Edit mode, the black keys on the keyboard are used for selecting functions, while the white keys are used for data entry and channel selection.

Your keyboard will exit Edit mode as soon as either a function is selected or the CANCEL or ENTER key is pressed. The LED above the Edit Mode button will turn off and the keyboard can then be used to play notes again. Some functions do not require confirmation via the Enter or Cancel keys. When these functions are selected, the keyboard will automatically exit Edit mode and return to Performance mode.

➜ ***IMPORTANT****: Not every music application can process all types of MIDI messages ProKeys Sono is capable of sending. Please consult your software's documentation for information on what messages it can accept.*



NOTE*: The M-Audio ProKeys Sono Drivers and Documentation CD-ROM contains a document showing a larger image of the keys and their advanced features in Edit mode called "KeyMap88.pdf." We recommend printing this document and keeping it with your ProKeys Sono for fast access to the advanced features in Edit Mode.*

Audio Options in Edit Mode

MONO Input Record Key

This setting determines if the Mono button on the top panel of ProKeys Sono affects how input signals are recorded, or only how they are heard while monitoring. By default, the Mono button only affects the monitor signal, recordings remain unaffected. Pressing C#2 in Edit mode and engaging the Mono button will cause all left and right input signals to be merged before being sent to the computer for recording. As a result, identical signals will be recorded to the left and the right channel of a stereo track, essentially creating a two-channel Mono recording. This feature is most useful, when only one of the inputs of ProKeys Sono is used at a time (e.g. the Mic input or the Instrument Input), as it allows you to record a single channel signal to both channels of a stereo track.

NOTE*: If the Mono button on the top panel is disengaged, this option does not have an impact on the signal path of audio being recorded.*

USB Record Key

This setting determines whether or not the internal ProKeys Sono voices will be sent to the computer for recording, along with signals from all audio inputs. By default, audio recordings made using ProKeys Sono will include the internal instrument sounds, if any of its sounds are playing during the recording process.

Pressing the D#2 key in Edit mode "disconnects" the internal sounds from the USB connection to the computer and prevents the keyboard's internal voices from being recorded along with signals from the audio inputs. In other words, the internal sounds will still be heard out of the main outputs, but these sounds will not be sent to the computer (through the USB connection) to be recorded.

Pressing the D#2 key toggles the USB Record setting and exits Edit mode. Repeating this process again toggles the USB Record setting back to its default state.

Button, Knob, Wheel and Pedal Jack Assignments

Data (Transpose) button Assignment Overview

The Data "<" and ">" buttons can be assigned to control one of seven possible MIDI functions:

- Transpose (ProKeys Sono 88 Default)
- Octave Shift
- Program Change
- Bank LSB
- Bank MSB
- MIDI Channel
- Master Tune Setting

In the diagram above, there is a group of seven black keys, labeled "Data = Octave, Data = Transpose, Data = Program, Data = Bank LSB, Data = Bank MSB, Data = Channel and Data = Tuning." These keys are used to select the desired alternate function of the Data buttons.

To select alternate Data button functions:

1. Press the Edit Mode button.
2. Press the black key that represents the function you want to assign to the Data buttons. ProKeys Sono will exit Edit mode as soon as you push one of these keys.

The LEDs above the Data buttons illuminate depending on their current setting. The LED above the "<" Data button will illuminate when the assigned parameter is set to a value less than zero; the LED above the ">" Data button will illuminate when the assigned parameter is set to a value greater than zero.

> ***NOTE**: Data buttons can control certain functions that cannot be set to values less than zero (such as MIDI channel selection). When used to control these types of functions, both lights above the buttons will remain off, regardless of the current setting of that function.*

Data Button Assignment Options:

1. Transpose (Default Data Key Assignment)

In many cases it is useful to increase or decrease the transmitted pitch by a small number of semitones. For example, you may be playing a song with a singer and the singer is having trouble hitting the high notes. In this case, you can try reducing the pitch by one or more semitones. This is achieved using a function called "Transpose."

On ProKeys Sono 88, the Data buttons control transpose shift by default. However, if these buttons have been programmed to control another function, you may wish to re-assign them to control transpose shift once again.

To assign the Data "<" and ">" buttons to transpose:

1. Press the Edit Mode button.
2. Press the black key above D3 (D#3), representing "Data = Transpose." ProKeys Sono will exit Edit mode as soon as D#3 has been pressed.

When the Data buttons are assigned to transpose the keyboard, the LEDs above the buttons indicate the direction of the transposition. To return the keyboard's transpose shift to zero, press both the Data "<" and ">" buttons at the same time. An additional method of transposing ProKeys Sono is described in the "ProKeys MIDI Output Settings" chapter of this User Guide.

2. Octave Shift

The Data "<" and ">" buttons can be assigned to control octave shift. When the Data buttons are set to control Octave shift, pressing the Data > button (right) will shift the notes played on the keyboard up by one octave. Pressing the Data < button (left) will shift the notes played on the keyboard down by one octave. Pressing both Data buttons together will restore the default octave (Octave shift = 0).

To assign the Data "<" and ">" buttons to control octave shift:

1. Press the Edit Mode button.
2. Press the black key above C3 (C#3), representing Data = Octave. ProKeys Sono will exit Edit mode as soon as C#3 has been pressed.

When the Data buttons are assigned to shift the octave of the keyboard, the LEDs above the buttons indicate the direction of the octave shift. To return the keyboard's octave shift to zero, press both the Data "<" and ">" buttons at the same time. An additional method of shifting the ProKeys Sono octave is described in the "ProKeys MIDI Output Settings" chapter of this User Guide.

3. Channel

MIDI data from the keyboard can be sent on any of 16 MIDI channels. The ProKeys Sono default is to transmit MIDI data on channel one. However, certain MIDI performance or recording scenarios may require the keyboard to send data on a different channel.

The Data "<" and ">" buttons can be configured to control the MIDI transmission channel setting. This will allow the Data "<" and ">" buttons to decrement or increment through the channels. When channel 16 is reached and ">" is pressed, channel one will be selected.

To assign the Data "<" and ">" buttons to alter the MIDI transmission channel:

1. Press the Edit Mode button.
2. Press the black key above C4 (C#4), representing Data = Channel. ProKeys Sono will exit Edit mode as soon as C#4 has been pressed.

If the Data "<" and ">" buttons are assigned to adjust the MIDI channel, the LEDs above the buttons will not change, since it is not possible to have a channel with a negative value. Pressing both the "<" and ">" buttons together will recall the default setting, channel one. An additional method of shifting the ProKeys Sono MIDI transmission channel is described in the "ProKeys MIDI Output Settings" chapter of this User Guide.

***NOTE**: In accordance with the General MIDI specification, channel 10 is reserved for drum sounds.*

4. Program Change

Program change MIDI messages can be used to select any of the 128 built-in MIDI instrument sounds on ProKeys Sono, or to select sounds on external MIDI synthesizers or sound modules connected to the MIDI output jack.

> ***NOTE**: When ProKeys Sono is set to Local On, program change messages are always sent to the MIDI Out jack and the internal sound engine. Program change messages can be sent to just the MIDI Out jack if the keyboard is set to Local Off. For additional information on Local On and Local Off modes, see the "Local On/Off Key" section of this chapter.*

If the Data "<" and ">" buttons have been assigned to control the program number, the LEDs above the buttons will not change, since it is not possible to select a program with a negative value.

To assign the Data "<" and ">" buttons to send program change messages:

1. Press the Edit Mode button.
2. Press the black key above F3 (F#3).

Pressing both the "<" and ">" buttons together will recall Program 0, which selects the first sound patch on any synthesizer capable of processing MIDI program changes. Program 0 corresponds to the Grand Piano sound on ProKeys Sono. An additional method of sending Program Change messages is described in the "ProKeys MIDI Output Settings" chapter of this User Guide.

5. and 6. Bank LSB and Bank MSB

Program changes are the most commonly used messages to change instruments and voices. However, the number of instruments accessible using only the program change MIDI command is limited to 128 (0-127). Since some devices have more than 128 voices, they require a method to organize their large number of sounds into banks. Such devices use Bank LSB (Least Significant Byte) and/or Bank MSB (Most Significant Byte) change messages to select between groups of sounds (banks). These devices then access the sounds within these banks by using program change messages. See the "MIDI Messages In-Depth" chapter of this User Guide for additional information. The Data "<" and ">" buttons can be assigned to send incremental Bank LSB or Bank MSB messages.[13]

To assign the Data "<" and ">" buttons to send bank change messages:

1. Press the Edit Mode button.
2. Press the black key above G3 (G#3) or A3 (A#3), representing Bank LSB or Bank MSB respectively.

Now the Data "<" and ">" buttons can be used to send Bank LSB or Bank MSB change messages. As with Program changes, if the Data "<" and ">" buttons are selected to vary the Bank LSB or MSB number, the LEDs above the buttons will not change, since it is not possible to have a Bank with a negative value. Pressing both the "<" and ">" buttons together will recall Bank 0. Bank 0 is the bank in which the internal ProKeys Sono sounds reside. An additional method of sending Bank Change messages is described in the "ProKeys MIDI Output Settings" chapter of this User Guide.

> [13] ***NOTE**: Bank change messages must be followed by a program change message in order to recall a sound. Bank change messages by themselves do not activate a sound, but only locate and access a predefined location of a set (bank) of 128 sounds.*

7. Tuning

This key will assign the Data buttons to increment or decrement the Master Tune Setting of ProKeys Sono. The tuning range is +/- 50 cents. This only affects the internal sound engine. Push and hold the Data < or > button while playing the keyboard until the desired tuning is found.

To assign the Data buttons to affect the tuning of the built-in ProKeys Sono sounds:

1. Press the Edit Mode button.
2. Press the black key above D4 (D#4), representing "Data = Tuning."

Now the Data "<" and ">" buttons can be used to adjust the master tuning of the sounds built into ProKeys Sono. Pressing both the Data "<" and ">" buttons at the same time restores the tuning offset to zero.

Wheel Assignment

It is possible to assign different MIDI controller numbers to the Modulation wheel. These parameters are called MIDI continuous controllers (MIDI CC). There are 128 MIDI continuous controllers (0-127, counting from and including zero) plus an additional 4 proprietary M-Audio controller numbers for a total of 132 assignable parameters (counting from and including zero to 131). Numbers beyond 127 are a proprietary method M-Audio uses to simplify the transmission of certain, otherwise more complicated multi-part MIDI messages. A full list of controller values is given at the end of this manual in Appendix C. For these controller values to have any effect on the sound, the receiving software or device has to be able to read and respond to these MIDI controller messages.

Some examples of useful MIDI CCs are:

- 01 Modulation 07 Volume 10 Pan (balance) 05 Portamento Time

To assign a MIDI controller message to the Modulation wheel:

1. Press the Edit Mode button.
2. Press the black key above F5 (F#5), representing "Wheel Assign."
3. Use the Numerical Data Entry keys G5 – B6 to enter the number of the MIDI controller you want to assign to the Modulation wheel.
4. Press the Enter key (C7).

If you make an error while entering the numerical data value, you can press the CANCEL key (C3) to exit Edit mode without changing the MIDI CC assigned to the Modulation wheel.

As an example, let's assign MIDI CC number 10 to the Modulation wheel. This means the Modulation wheel will control Pan (or balance):

1. Press the Edit Mode button.
2. Press the black key above F5 (F#5), representing "Wheel Assign."
3. Press A5 to enter "1."
4. Press G5 to enter "0" so you have entered "10."
5. Press C7 for "ENTER."

To re-assign the Modulation wheel to its default function:

1. Press the Edit Mode button.
2. Press the black key above F5 (F#5), representing "Wheel Assign."
3. Press the F5 key (Default). When the Default key is pressed, the parameter is reset to its default value, and Performance mode resumes.

Pedal Assignment

The Sustain pedal can be assigned to send standard MIDI CCs up to 127 and extended custom messages from 128 to 131. The default for the Sustain pedal is sending MIDI Controller message 64. Use the G#5 key in Edit mode to change the MIDI CC assignment for the Sustain Pedal.

To assign a MIDI controller message to the Sustain Pedal jack:

1. Press the Edit Mode button.
2. Press the black key above G5 (G#5), representing "Pedal Assign."
3. Use the Numerical Data Entry keys G5 – B6 to enter the number of the controller value you want to assign to the Sustain Pedal Jack.
4. Press C7 for "ENTER."

If you make an error while entering the numerical data value, you can press the CANCEL key (C3) to exit Edit mode without changing the MIDI CC assigned to the Sustain Pedal jack.

To re-assign the Sustain Pedal jack to its default function:

1. Press the Edit Mode button.
2. Press the black key above G5 (G#5), representing "Pedal Assign."
3. Press the F5 key (Default). When the Default key is pressed, the parameter is reset to its default value, and Performance mode resumes.

Knob Assignment

The Voice Volume knob can be assigned to any of 132 controllers (0-131) shown at the back of this manual in Appendix C.

To assign a MIDI controller message to the Voice Volume knob:

1. Press the Edit Mode button.
2. Press the black key above A5 (A#5), representing "Knob Assign."
3. Use the Numerical Data Entry keys G5 – B6 to enter the number of the controller value you want to assign to the Voice Volume knob.
4. Press C7 for "ENTER."

If you make an error while entering the numerical data value, you can press the CANCEL key (C3) to exit Edit mode without changing the MIDI CC assigned to the Voice Volume knob.

To re-assign the Voice Volume knob to its default function:

1. Press the Edit Mode button.
2. Press the black key above A5 (A#5), representing "Knob Assign."
3. Press the F5 key (Default). When the Default key is pressed, the parameter is reset to its default value, and Performance mode resumes.

***NOTE**: Optional MIDI parameters assigned to the Voice Volume knob, Modulation wheel, or Sustain Pedal jack are not stored when the keyboard is turned off. These parameters will reset to their default values each time the keyboard is powered on.*

TIP: Using the Modulation wheel or Voice Volume knob to set the reverb or chorus depth on ProKeys Sono

Changing Reverb Depth

The Modulation wheel and/or the Voice Volume knob can be re-assigned to control the depth of the built-in ProKeys Sono reverb. To do this:

1. *Press the Edit Mode button.*
2. *Press either the Wheel Assign (F#5) or Knob Assign (A#5) key.*
3. *Press B6 to enter "9."*
4. *Press A5 to enter "1" so you have entered "91."*
5. *Press C7 for "ENTER."*

This setting can be undone by powering the unit off and back on, or by using the Default key as described in the next section.

CC 91 is the standard MIDI controller number for reverb depth (see Appendix C).

Changing Chorus Depth

The Modulation wheel and/or the Voice Volume knob can be re-assigned to control the depth of the built-in ProKeys Sono chorus. To do this:

1. *Press the Edit Mode button.*
2. *Press either the Wheel Assign (F#5) or Knob Assign (A#5) key.*
3. *Press B6 to enter "9."*
4. *Press C6 to enter "3" so you have entered "93."*
5. *Press C7 for "ENTER."*

This setting can be undone by powering the unit off and back on, or by using the Default key as described in the next section.

CC 93 is the standard MIDI controller number for chorus depth (see Appendix C).

Restoring Default Assignments

The Default key is used to selectively reset controller assignments. To reset a specific controller assignment, be sure you are in Edit mode. Press the key for the parameter you would like to reset (Knob Assign, Pedal Assign, or Wheel Assign), and then press the Default key (F5). When the Default key is pressed, the parameter is reset to its default value, and Performance mode resumes.

> ***NOTE**: Each time the keyboard is turned off, optional MIDI parameters assigned to specific hardware controllers will be lost, and the defaults will be restored.*

ProKeys MIDI Output Settings

Vel Curve Selection

ProKeys Sono provides three velocity curves to accommodate a variety of playing styles. Three of the keys in Edit mode are dedicated to the selection of the built-in Low, Mid and Hi velocity curves. The default curve is 'Mid' which will always be selected when ProKeys Sono is powered on.

Pressing one of these keys in Edit mode selects an alternative curve.

Vel Curve=LOW (F#2) makes it easier to play quietly. This curve generates lower velocities than the default curve (MID).

Vel Curve=MID (G#2) is a neutral curve between the low and hi velocity curves.

Vel Curve=HI (A#2) makes it easier to play loudly. This curve generates higher velocities than the default curve (MID).

After one of the Velocity Curve keys is pressed in Edit mode, Performance mode resumes.

OCTAVE:

To change the Octave shift using the Octave "-" and "+" Keys in Edit mode:

1. Press the Edit Mode button.
2. Press the black key above C5 (C#5), representing "Octave -," to shift the keyboard down by one octave. It is possible to shift the keyboard down a total of three octaves.
3. Press the black key above D5 (D#5), representing "Octave +," to shift the keyboard up by one octave. It is possible to shift the keyboard up a total of three octaves.
4. When you have chosen your octave shift, either press C7 representing "ENTER" or press the Edit Mode button to exit Edit mode.

TRANSPOSE:

To change the Transposition using the Transpose "-" and "+" Keys in Edit mode:

1. Press the Edit Mode button.
2. Press the black key above C6 (C#6), representing "Transpose -," to shift the keyboard down by one semitone.
3. Press the black key above D6 (D#6), representing "Transpose +," to shift the keyboard up by one semitone.
4. Press C7 representing "ENTER," or press the Edit Mode button to exit Edit mode.

CHANNEL:

To change the MIDI transmission channel using the Channel Keys in Edit mode:

1. Press the Edit Mode button.
2. Press one of the 16 Channel keys from D3 to E5, whichever one represents the channel you need. ProKeys Sono will exit Edit mode as soon as a Channel key has been pressed.

   ***NOTE**: In accordance with the General MIDI specification, channel 10 is reserved for drum sounds.*

To send data on channel 10:

1. Press the Edit Mode button,
2. Press the F4 key on ProKeys Sono to select channel 10.

MIDI Out Mode Key

The MIDI Out Mode key (G#4) determines what data is sent to the external MIDI Out jack. Pressing this key in Edit mode will toggle between two options:

1) MIDI generated by playing the keys on the keyboard is sent to the external MIDI output jack (default).

2) MIDI signals from the computer's sequencing application that are routed to the "ProKeys Sono MIDI Out"[14] port are sent to the external MIDI output jack.

When the MIDI Out Mode setting has been left in its default setting, MIDI data generated by playing the keys on the keyboard will be transmitted from the keyboard to the external MIDI output jack and also to your computer via USB. This is the default setting for ProKeys Sono.

If the MIDI Out Mode setting has been configured to pass signals coming from your computer via USB, the data coming from the host computer via USB will be sent directly to the MIDI Out jack. In this mode, MIDI data generated by playing the keys on the keyboard is not sent to the MIDI Output jack, but only to the computer via USB.

In Edit mode, when the MIDI Out Mode key (G#4) is pressed, the function is toggled and Edit mode is exited. Pressing the Piano Reset button or turning the keyboard off and back on, will restore the default setting.

> [14] ***NOTE**: MIDI Out mode only affects signals sent from your computer's sequencing application to the "ProKeys Sono MIDI Out" port; this mode does not affect MIDI data sent to the "ProKeys Sono Voices" port.*

Local On/Off

The Local On/Off Key (A#4) determines the source of the data stream that is routed to the sounds built into ProKeys Sono. By default, notes played on the keyboard and notes received via USB from a connected computer are both routed to the ProKeys internal sound engine. However, pressing this key in Edit mode will set the Local On/Off option to "Off." This causes the internal sound engine to no longer directly receive notes from the keyboard, yet still receive MIDI data from a connected computer.

When the Local On/Off key is toggled, the sounds built into ProKeys Sono will not be played by the piano keyboard. However, notes played on the keyboard will continue to be sent to the MIDI Out jack as well as to the computer via USB. In standalone mode, the Local On/Off key allows a remote MIDI device to be controlled without ProKeys Sono playing its internal sounds.

In Edit mode, when the Local On/Off Key is pressed, the function is toggled and Edit mode is exited. The keyboard then returns to Performance mode and the Edit Mode LED goes out. At any time, pressing the Piano Reset button will restore this mode to Local On. Switching the keyboard off and on will also restore this setting back to its default.

Local Off mode is often used to control a software synthesizer running on a connected computer, without layering the built-in ProKeys Sono sounds on top of the software synthesizer's tone.

Panic

ProKeys Sono has been designed to make working with MIDI on your computer as simple as possible. However, sometimes things can go wrong and you may experience "stuck" notes (i.e., notes that sustain indefinitely) or unexpected changes in your sounds due to errant MIDI CC commands being issued. ProKeys Sono includes a "Panic" function to counter this.

This function sends "Reset All Controllers" and "All Notes OFF" messages on all MIDI channels. This lets you immediately stop stuck notes and remove applied MIDI CC effects without having to figure out what has caused the unexpected changes in your sound.

To send a Panic MIDI message:

1. Press the Edit Mode button.
2. Press the black key above F4 (F# 4), representing "Panic."
3. Edit mode will exit, and sustaining notes will stop playing.

Sending a Bank Change or Program Change Message

PROGRAM CHANGE:

Sending a specific program change message is useful if you want to load a particular sound patch.

To send a specific program change message in Edit mode:

1. Press the Edit Mode button.
2. Press the black key above F6 (F#6), representing "Program."
3. Press the number keys (G5 through B6) that correspond to the program number you wish to load.
4. Press C7 (Enter). ProKeys Sono will exit Edit mode as soon as a C7 has been pressed.

BANK CHANGE:

Sending a specific bank change message is useful if you want to select a particular sound bank.

To send a single bank change in Edit mode:

1. Press the Edit Mode button.
2. Press the black key above G6 (G#6), or A6 (A#6), representing Bank LSB or Bank MSB respectively.
3. Press the number keys (G5 through B6) that correspond to the bank number you wish to select.
4. Press C7 (Enter). ProKeys Sono will exit Edit mode as soon as a C7 has been pressed.

***TIP**: As an example, let's use a program change MIDI message to activate the internal cello sound on ProKeys Sono. To do this we need to send program change number 42 (this corresponds to a cello sound in the General MIDI Instruments list in Appendix A).*

1. *Press the Edit Mode button.*
2. *Press the black key above F6 (F#6), representing "Program."*
3. *Press keys D6, then B5, then C7 (Enter). This enters the combination: "4," "2," "ENTER."*

This message will be sent to the ProKeys Sono internal sound engine and also to any external devices connected to the ProKeys Sono MIDI Out jack. Now the keyboard is set to play the internal General MIDI cello sound 42 (from the General MIDI Instruments standard list). The full list of General MIDI program numbers is given in Appendix A at the end of this manual.

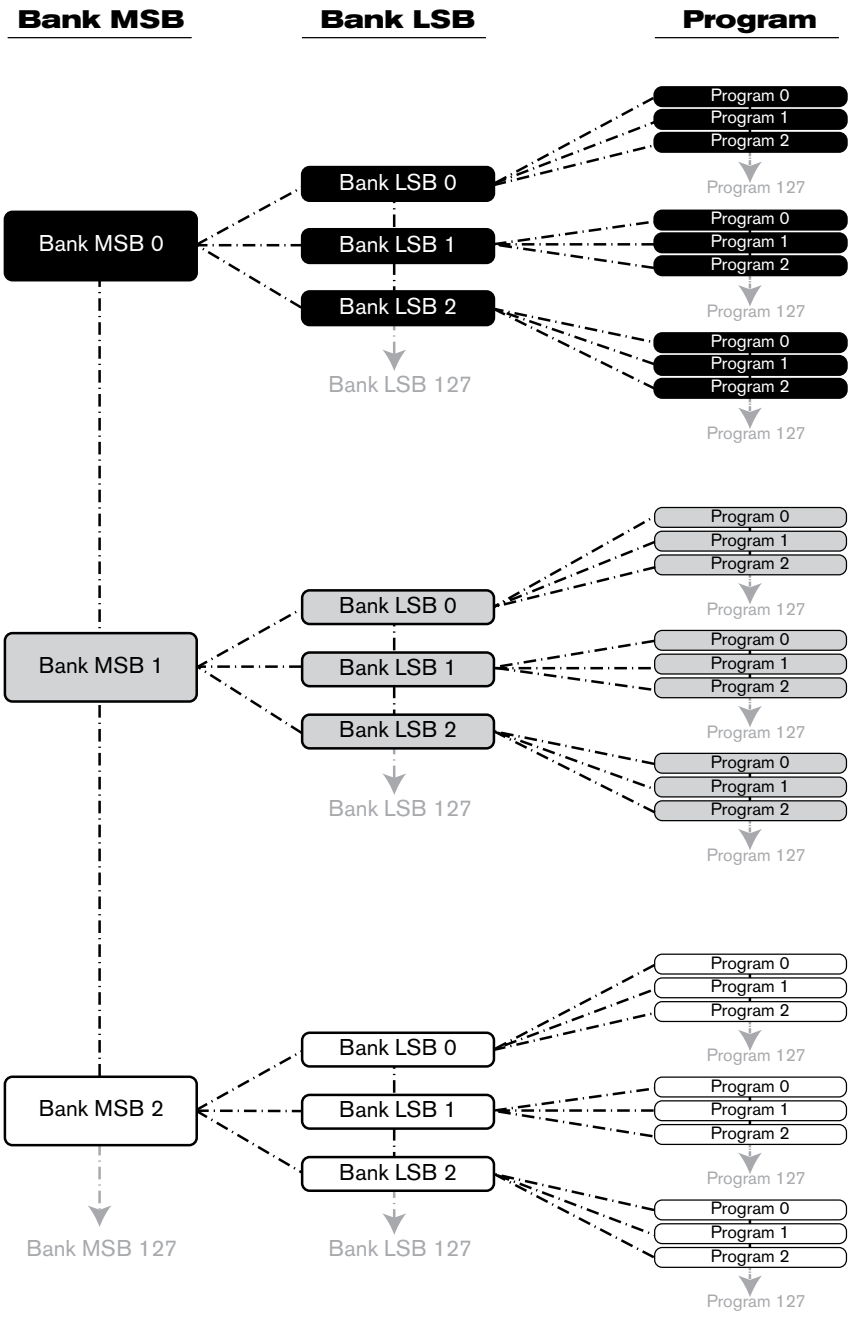
***NOTE**: Bank change messages must be followed by a program change message in order to load a sound. Bank change messages by themselves do not activate a sound, but only locate and access a predefined location of a set (bank) of 128 sounds.*

MIDI Messages In-Depth

Program & Bank Changes

When the MIDI standard was first established, it enabled the user to access only 128 different sounds using program change messages (0-127). As MIDI devices grew to be more sophisticated and contain more sounds, bank change messages were included in an updated MIDI specification to allow for more than 128 sounds to be accessed.

The language MIDI uses to communicate between musical instruments only allows for program change commands 0-127, for a total of 128 possible programs (127 programs + program "0" = 128 programs total). Because of inherent limitations of the MIDI communication protocol, the number of directly accessible programs (using program change messages) cannot easily be expanded beyond 128. Thus, a system of banks, with 128 sounds in each, has been created that enables manufacturers to overcome the 128-sound MIDI limit.



128 banks with 128 sounds in each bank is the basic principle used to expand the number of accessible sounds. However, to avoid reaching the new limit of the resulting 16,384 possible sounds (128 banks x 128 programs) accessible using a bank change combined with a program change, another layer of banks was added. The result is a system of 128 banks that can contain 128 sub-banks in each of them, which, in turn, can contain 128 sounds (programs) within them.

Bank change messages are useful when calling up sounds from a large library that may exist in a particular sound module or software synthesizer. For example, devices that are built according to Roland's GS specification or Yamaha's XG specification require you to specify a bank change in order to access the extra voices that these devices provide.

MIDI CC 0 is the bank select MSB (Most Significant Byte) message. This MIDI message is 7-bit in size and can be used to select any of 128 banks. This message can be used in conjunction with MIDI CC 32 which is bank select LSB (Least Significant Byte): a separate 7-bit message allowing additional selection of any of another 128 sub-banks. The combination of Bank MSB and LSB messages gives a 14-bit message that can select any of a possible 16,384 banks. Each bank can in turn contain 128 possible sounds selected via a separate program change MIDI message. This enables a user to theoretically recall over two million programs directly, using only MIDI commands. However, most devices only use a few different banks, and you can often ignore the LSB message.

You will find many MIDI devices respond to program change commands and many are organized according to the GM listing. In General MIDI devices, different sounds are organized in the same way from device to device. Piano sounds are in their particular place, string sounds are in their place, drum sounds are in their place, and so on. All GM devices (both hardware and software sound modules) are clearly labeled as such, so you know that their sounds are organized in the General MIDI structure. When a GM device receives a MIDI program change, it calls up a type of sound that you expect from the GM sound set. All non-GM MIDI sound modules call up unique sounds from their memory upon receiving MIDI program changes. Since the sounds in a non-GM device are not arranged in a particular order, you need to take a look at the device itself to see which sound you want and at which location in the memory it resides. Many VST instruments such as Native Instruments' FM7 or the synth modules in Propellerhead Reason are non-GM devices.

You can send Program Change, Bank LSB and Bank MSB messages directly from the ProKeys Sono keyboard. Please consult the "Advanced ProKeys Sono Functions in Edit Mode" section of this User Guide for further details.

NRPN/RPNs

Non-registered parameter numbers (NRPN's) are device-specific messages that enable you to control synthesizers and sound modules via MIDI. The MIDI specification defines open parameter numbers to allow manufacturers to specify their own controllers. The more common of these are registered by the MIDI Manufacturer's Association and are now part of the MIDI specification, hence the term Registered Parameter Numbers – RPN's (See Appendix C). Each NRPN/RPN has an associated 2-byte number. The two bytes allow for 128 values each. (An RPN or NRPN message is made up of two parts: the MSB and the LSB message. Both of these messages together constitute an RPN or NRPN command.) This allows for 16,384 values in total.

MIDI controllers 98 and 99 represent the NRPN LSB and MSB respectively, while 100 and 101 represent the RPN LSB and MSB messages (see the MIDI controllers list in Appendix C). To transmit an NRPN/RPN message, these LSB and MSB controller messages are sent along with their user-specified values. A further controller message and value needs to be sent to specify the (coarse or fine) value adjustment. This is specified by controller number 6 (data entry) for coarse adjustments or number 38 for fine adjustments.

A list of NRPN's is usually given in the user's manual of any device that receives NRPN messages. It is always necessary that the NRPN MSB and LSB be sent together. Both will be specified in the device's manual.

Troubleshooting

ProKeys Sono is a high-quality digital piano that has been tested under a wide variety of conditions to ensure trouble-free performance. In the event that you do experience difficulty with your ProKeys Sono, this section provides tips to help resolve some basic issues that you may encounter.

Problem: My ProKeys Sono keyboard suddenly stopped working after having performed fine since installation.

Solution: Close any music applications you are using, switch ProKeys Sono off, and restart your computer. Once your computer has completely restarted, switch ProKeys Sono back on and try again to see if the problem resolves.

Problem: I have connected a sustain pedal to my M-Audio keyboard, but its operation is reversed (i.e., the notes sustain when the pedal isn't pressed, but the notes stop sustaining once the pedal is pressed).

Solution: The polarity of the sustain pedal is calculated by the keyboard upon startup. When ProKeys Sono is powering up, the sustain pedal is assumed to be in the OFF position. It is important that the sustain pedal is not pressed down during startup, otherwise its operation may be reversed.

If you would like to intentionally reverse the polarity of your sustain pedal (i.e., notes are sustained when the pedal is up; notes stop sustaining when the pedal is pressed), hold the pedal down while the keyboard is being switched on.

Problem: When playing a virtual instrument loaded in my music software, or when attempting to monitor my microphone or instrument input, there is a noticeable delay before I hear any sound.

Solution: This delay is known as latency, and it can be adjusted by changing the buffer size setting in your M-Audio Control Panel. The goal is to set the buffer size as low as possible without experiencing artifacts in the audio. Faster computers generally allow for smaller buffer size settings, and thus less latency.

When monitoring signals from the Microphone, Instrument or Aux inputs, you can also avoid this problem by using the Direct Monitor knob instead of monitoring through your music software. See the "Using Direct Monitoring" section in the "ProKeys Sono Audio Setup and Controls" portion of this User Guide to learn more about direct monitoring.

Problem: I have connected the keyboard to my computer with the USB cable, but I cannot locate the ProKeys Sono USB keyboard in my software's MIDI devices dialog box.

Solution 1: ProKeys Sono may not be receiving enough USB bus power to function correctly. Try plugging ProKeys Sono into a different USB port or a powered USB hub connected to your computer.

Solution 2: In Windows XP, ProKeys Sono will appear as "USB Audio Device" if the optional drivers have not been installed. Select "USB Audio Device" as your audio and MIDI input and output device.

Problem: I connected ProKeys Sono to my Windows computer and noticed that a question mark appears in the Windows Device Manager under Other Devices > M-Audio DFU. Does this indicate that there is a problem with ProKeys Sono?

Solution: This behavior is normal and your ProKeys Sono will function normally as a class-compliant device (i.e., without any drivers). Installing the ProKeys Sono drivers extends the keyboard's functionality in various ways (i.e., multi-client support, support for qualified versions of the Pro Tools M-Powered software, and allowing large SysEx transfers) and should resolve any "DFU" related messages that appear when drivers are not present.

Problem: My synthesizer always recalls the sound next to the program number that I have sent to it from ProKeys Sono. For example, if I send a program change with the number 40 (Violin), my software loads sound number 41 (Viola).

Solution: Some General MIDI modules count their sound patches from 1 – 128 instead of 0-127. Both methods are common. As a result, there may be an offset of +/-1 between the program change number sent from the keyboard and the recalled sound patch on your module.

Problem: When I press the keys or use any of the MIDI controls (wheel, knob, data buttons, etc.), no data is being transmitted from the MIDI output jack.

Solution: This may be the result of the ProKeys Sono MIDI Out mode being set to USB. The MIDI Out jack can be configured to accept MIDI data from either the ProKeys Sono keyboard or from the computer via the USB connection. If the MIDI Out mode is set to USB, the controls on the keyboard will not send any data to the MIDI Out jack. See the "ProKeys MIDI Output Settings" chapter of this User Guide to learn how to toggle MIDI Out mode back to transmit MIDI events generated by the ProKeys Sono keyboard.

Alternatively, you may simply switch the keyboard off and power it back on. This will restore the default, causing the MIDI output jack to transmit MIDI events generated by the ProKeys Sono keyboard.

Problem: When using ProKeys Sono with Windows XP or Vista, the computer plays no sound through the ProKeys Sono main outputs.

Solution:

If you have not done so already, try installing the ProKeys Sono drivers to see if this problem resolves. If this does not resolve the issue:

- Open the Control Panel and double-click the System icon (under Performance and Maintenance if you are in Category view).
- Select the Hardware tab and click the Device Manager button.
- Click the plus sign ("+") next to Sound, Video and Game Controllers, and locate the ProKeys Sono listing. If you see a question mark or exclamation point next to it, or if you don't see it listed, you may need to reinstall the driver software.
- Make sure your audio software has been configured to use ProKeys Sono. This configuration process varies from application to application, but it is usually done through a "preferences" or "configuration" menu. See your application's documentation to learn more about this.

Problem: I cannot hear the internal sounds of ProKeys Sono when using the keyboard with a computer-based sequencer in Local Off mode.

Solution: This behavior is normal. Local Off mode interrupts the connection between the internal sound engine and the various MIDI controls (i.e., the keys, wheel, knob, etc.) of ProKeys Sono. If you are using ProKeys Sono with a software sequencer and would like to play the internal sounds of ProKeys Sono, make sure that the software sequencer's track that is recording MIDI data from the keyboard is sending that MIDI data back to the "ProKeys Sono Voices" MIDI output port. This option of looping MIDI data back to its source is sometimes referred to as "MIDI Monitor" or "pass through" and allows synthesizers to trigger their own sounds when Local Off mode is engaged. See your software's documentation for more information on this.

Problem: My ProKeys Sono MIDI controls (such as Voice Volume knob, data buttons, the Reverb and Chorus on/off buttons, etc.) stopped working when the keyboard was set to Local Off mode.

Solution: If your ProKeys Sono has been set to "Local Off" mode, the MIDI Controls (piano keys, knobs, buttons, etc.) are "disconnected" from the internal sound engine and will not directly control the sound engine. In this case, you must make sure that the MIDI track in your sequencing software is configured to route the MIDI signals from ProKeys Sono back to the keyboard by activating "ProKeys Sono Voices" as the MIDI output port for the selected MIDI track. Once MIDI data is routed back to ProKeys Sono this way, the various MIDI controls will continue to work as expected.

Problem: I am unable to view input selection options and route audio from the ProKeys Sono microphone input into Ableton Live Lite.

Solution: In Ableton Live Lite, click View and make sure that the In/Out option is checked. On an audio track, select "Ext In" and "1" from the audio input drop down menus. Further information on this can be found in the Ableton Live Lite Help menu.

Appendices - Useful MIDI Data

Appendix A - General MIDI Instruments

Piano	**Bass**	**Reed**	**Synth Effects**
0 Acoustic Grand Piano [15]	32 Acoustic Bass	64 Soprano Sax	96 SFX Rain
1 Bright Acoustic Piano [15]	33 Electric Fingered Bass	65 Alto Sax	97 SFX Soundtrack
2 Electric Grand Piano	34 Electric Picked Bass	66 Tenor Sax	98 SFX Crystal
3 Honky Tonk Piano	35 Fretless Bass	67 Baritone Sax	99 SFX Atmosphere
4 Electric Piano 1 [15]	36 Slap Bass 1	68 Oboe	100 SFX Brightness
5 Electric Piano 2	37 Slap Bass 2	69 English Horn	101 SFX Goblins
6 Harpsichord	38 Synth Bass 1	70 Bassoon	102 SFX Echoes
7 Clavinet [15]	39 Synth Bass 2	71 Clarinet	103 SFX Sci- Fi
Chromatic Percussion	**Strings/ Orchestra**	**Pipe**	**Ethnic**
8 Celesta	40 Violin	72 Piccolo	104 Sitar
9 Glockenspiel	41 Viola	73 Flute	105 Banjo
10 Music Box	42 Cello	74 Recorder	106 Shamisen
11 Vibraphone	43 Contrabass	75 Pan Flute	107 Koto
12 Marimba	44 Tremolo Strings	76 Bottle Blow	108 Kalimba
13 Xylophone	45 Pizzicato Strings	77 Shakuhachi	109 Bag Pipe
14 Tubular bells	46 Orchestral Harp	78 Whistle	110 Fiddle
15 Dulcimer	47 Timpani	79 Ocarina	111 Shanai
Organ	**Ensemble**	**Synth Lead**	**Percussive**
16 Drawbar Organ [15]	48 String Ensemble 1 [15]	80 Synth Square Wave	112 Tinkle Bell
17 Percussive Organ	49 String Ensemble 2 (Slow)	81 Synth Sawtooth Wave	113 Agogo
18 Rock Organ	50 Synth Strings 1	82 Synth Calliope	114 Steel Drums
19 Church Organ	51 Synth Strings 2	83 Synth Chiff	115 Woodblock
20 Reed Organ	52 Choir Aahs [15]	84 Synth Charang	116 Taiko Drum
21 Accordion	53 Voice Oohs	85 Synth Voice	117 Melodic Tom
22 Harmonica	54 Synth Choir	86 Synth Fifths Sawtooth Wave	118 Synth Drum
23 Tango Accordion	55 Orchestral Hit	87 Synth Brass & Lead	119 Reverse Cymbal
Guitar	**Brass**	**Synth Pad**	**Sound Effects**
24 Nylon Acoustic Guitar	56 Trumpet	88 New Age Synth Pad	120 Guitar Fret Noise
25 Steel Acoustic Guitar	57 Trombone	89 Warm Synth Pad	121 Breath Noise
26 Jazz Electric Guitar	58 Tuba	90 Poly Synth Pad	122 Seashore
27 Clean Electric Guitar	59 Muted Trumpet	91 Choir Synth Pad	123 Bird Tweet
28 Muted Electric Guitar	60 French Horn	92 Bowed Synth Pad	124 Telephone Ring
29 Overdrive Guitar	61 Brass Section	93 Metal Synth Pad	125 Helicopter
30 Distorted Guitar	62 Synth Brass 1	94 Halo Synth Pad	126 Applause
31 Guitar Harmonics	63 Synth Brass 2	95 Sweep Synth Pad	127 Gun Shot

[15] *These sounds are ProKeys Sono premium-quality voices.*

Appendix B - Channel 10 Drum Map

Key#	Drum Sound	Key#	Drum Sound
35	Acoustic Bass Drum	59	Ride Cymbal 2
36	Bass Drum 1	60	Hi Bongo
37	Side Stick	61	Low Bongo
38	Acoustic Snare	62	Mute Hi Conga
39	Hand Clap	63	Open Hi Conga
40	Electric Snare	64	Low Conga
41	Low Floor Tom	65	High Timbale
42	Closed Hi-Hat	66	Low Timbale
43	High Floor Tom	67	High Agogo
44	Pedal Hi-Hat	68	Low Agogo
45	Low Tom	69	Cabasa
46	Open Hi-Hat	70	Maracas
47	Low-Mid Tom	71	Short Whistle
48	Hi-Mid Tom	72	Long Whistle
49	Crash Cymbal 1	73	Short Guiro
50	High Tom	74	Long Guiro
51	Ride Cymbal 1	75	Claves
52	Chinese Cymbal	76	Hi Wood Block
53	Ride Bell	77	Low Wood Block
54	Tambourine	78	Mute Cuica
55	Splash Cymbal	79	Open Cuica
56	Cowbell	80	Mute Triangle
57	Crash Cymbal 2	81	Open Triangle
58	Vibraslap		

Appendix C - Standard MIDI Controller Numbers (MIDI CCs)

00 Bank Select	49 Gen Purpose 2 LSB	98 NRPN LSB
01 Modulation	50 Gen Purpose 3 LSB	99 NRPN MSB
02 Breath Control	51 Gen Purpose 4 LSB	100 RPN LSB
03 Controller 3	52 Controller 52	101 RPN MSB
04 Foot Control	53 Controller 53	102 Controller 102
05 Portamento Time	54 Controller 54	103 Controller 103
06 Data Entry	55 Controller 55	104 Controller 104
07 Channel Volume	56 Controller 56	105 Controller 105
08 Balance	57 Controller 57	106 Controller 106
09 Controller 9	58 Controller 58	107 Controller 107
10 Pan	59 Controller 59	108 Controller 108
11 Expression	60 Controller 60	109 Controller 109
12 Effects Controller 1	61 Controller 61	110 Controller 110
13 Effects Controller 2	62 Controller 62	111 Controller 111
14 Controller 14	63 Controller 63	112 Controller 112
15 Controller 15	64 Sustain Pedal	113 Controller 113
16 Gen Purpose 1	65 Portamento	114 Controller 114
17 Gen Purpose 2	66 Sostenuto	115 Controller 115
18 Gen Purpose 3	67 Soft Pedal	116 Controller 116
19 Gen Purpose 4	68 Legato Pedal	117 Controller 117
20 Controller 20	69 Hold 2	118 Controller 118
21 Controller 21	70 Sound Variation	119 Controller 119
22 Controller 22	71 Resonance	Channel Mode Messages:
23 Controller 23	72 Release Time	120 All Sound off
24 Controller 24	73 Attack Time	121 Reset All Controllers
25 Controller 25	74 Cut-off Frequency	122 Local Control
26 Controller 26	75 Controller 75	123 All Notes Off
27 Controller 27	76 Controller 76	124 Omni Off
28 Controller 28	77 Controller 77	125 Omni On
29 Controller 29	78 Controller 78	126 Mono On (Poly Off)
30 Controller 30	79 Controller 79	127 Poly On (Mono Off)
31 Controller 31	80 Gen Purpose 5	
32 Bank Select LSB	81 Gen Purpose 6	Extra RPN Messages:
33 Modulation LSB	82 Gen Purpose 7	128 Pitch Bend sensitivity
34 Breath Control LSB	83 Gen Purpose 8	129 Fine Tune
35 Controller 35	84 Portamento Control	130 Coarse Tune
36 Foot Control LSB	85 Controller 85	131 Channel Pressure
37 Portamento Time LSB	86 Controller 86	
38 Data Entry LSB	87 Controller 87	
39 Channel Volume LSB	88 Controller 88	
40 Balance LSB	89 Controller 89	
41 Controller 41	90 Controller 90	
42 Pan LSB	91 Reverb Depth	
43 Expression LSB	92 Tremelo Depth	
44 Controller 44	93 Chorus Depth	
45 Controller 45	94 Celeste (De- tune)	
46 Controller 46	95 Phaser Depth	
47 Controller 47	96 Data Increment	
48 Gen Purpose 1 LSB	97 Data Decrement	

Appendix D - Additional RPN Messages

You may have noticed that although we have stated there are 128 MIDI controller messages (0 – 127), Appendix C shows 132 assignable controller messages. This is because messages 128 – 131 are a different type of MIDI message, defined in the MIDI Specification as RPN messages. M-Audio has created four messages that are sent like MIDI CCs, but actually transmit a series of RPN messages. This makes sending these complex multi-part messages as easy as sending a MIDI CC message. You can assign these to the controls on your ProKeys Sono keyboard in exactly the same way as any other MIDI controller message. The RPN messages control the following:

Controller Number	MIDI Message	Use
128	Pitch Bend Sensitivity	Alters the range of a pitch bend message
129	Fine Tune	Adjusts the tuning of your sound module or synthesizer in small steps
130	Coarse Tune	Adjusts the tuning of your sound module or synthesizer in large steps
131	Channel Pressure [16]	Adds an effect such as vibrato or brightness, depending on the instrument settings and capabilities

[16] Channel Pressure is not an RPN message. However, it is an additional effect message defined in the General MIDI specification and this is why we have included it in Appendix D.

Appendix E - Piano Reset Button

When the Piano Reset button is pressed, ProKeys Sono performs the following sequence of functions:

1. MIDI Out mode is set to send MIDI from the keyboard to the computer via USB and to the external MIDI Out jack.
2. Local mode is set to Local On.
3. An 'All Notes Off' command is sent on MIDI channel 1.
4. A 'Reset All Controllers' command is sent on MIDI channel 1.
5. The Voice Volume knob is assigned to send MIDI controller 7 (Volume) messages.
6. The Modulation Wheel is assigned to send MIDI controller 1 (Modulation) messages.
7. The Sustain Pedal is assigned back to controller 64 (Sustain).
8. The Global Transmit channel is set to 1.
9. Transpose and octave shift are both set back to zero.
10. A Program Change = 0 message is sent on MIDI channel 1.
11. Bank Change MSB = 0 and Bank Change LSB = 0 messages are sent on MIDI channel 1.
12. The Reverb Depth is set back to the default value for the Piano Voice.
13. The Chorus Depth is set back to the default value for the Piano Voice.
14. The current status of the Sustain Pedal is sent on MIDI channel 1.

Technical Specifications

44.1 kHz sampling rate unless otherwise stated

Mic Inputs	
Input Impedance	4.4k Ohms
Maximum Input Level at minimum gain	-2.2 dBu (0.6 Vrms), balanced
SNR	-96 dB, A-weighted
Dynamic Range	96 dB, A-weighted
THD+N	0.004 % (-88 dB) @ -1 dBFS, 1 kHz
Frequency Response	20 Hz to 20 kHz, +/- 0.5 dB
Available Pre-amp Gain	41 dB
Instrument Input	
Input Impedance	1MOhm unbalanced
Maximum Input Level at minimum gain	+12 dBV (4 Vrms)
SNR	-94 dB, A-weighted
Dynamic Range	94 dB, A-weighted
THD+N	0.00782 % (-82.1 dB) @ -1 dBFS, 1 kHz
Frequency Response	20 Hz to 20 kHz, +/- 0.6 dB
Available Pre-amp Gain	40 dB
Aux Inputs	
Input Impedance	10K Ohm unbalanced
Maximum Input Level	+2 dBV unbalanced
SNR	-96 dB, A-weighted
Dynamic Range	96 dB, A-weighted
THD+N	< 0.005 % (-86 dB) @ -1 dBFS, 1 kHz
Frequency Response	20 Hz to 20 kHz, +/- 0.5 dB
Line Outputs	
Output Impedance	240 Ohm unbalanced
Maximum Output Level	+1.8 dBV (1.2 Vrms)
Channel-to-Channel Crosstalk	< -88 dB @ 1 kHz
SNR	-103 dB, A-weighted
Dynamic Range	95 dB, A-weighted
THD+N	0.00391 % (-88.2 dB) @ -1 dBFS, 1 kHz
Frequency Response	20 Hz to 20 kHz, +/- 0.1 dB
Headphone Outputs	
Maximum Output	-2 dBV (0.8 Vrms) into 32 ohms @ < 0.05% THD+N
	18.2 mW into 32 ohms @ < 0.05% THD+N
Working Range	32 to 600 ohms
Frequency Response	20 Hz to 20 kHz, +/- 1.3 dB

Technical Info

Caution: Electro Static Discharge, Electrical Fast Transient and Conducted RF interference may cause the unit malfunctioning. In such case, unplug the unit and plug it in again to restore normal operation.

Note: Your M-Audio product has been tested to comply with FCC Standards FOR HOME OR OFFICE USE. Modifications not authorized by the manufacturer may void users authority to operate this device.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

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Warranty

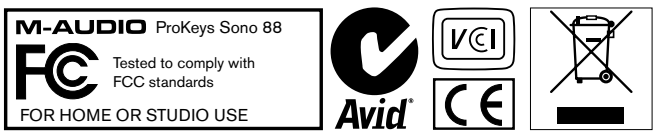
Warranty Terms

M-Audio warrants products to be free from defects in materials and workmanship, under normal use and provided that the product is owned by the original, registered user. Visit www.m-audio.com/warranty for terms and limitations applying to your specific product.

Warranty Registration

Immediately registering your new M-Audio product entitles you to full warranty coverage and helps M-Audio develop and manufacture the finest quality products available. Register online at www.m-audio.com/register to receive FREE product updates and for the chance to win M-Audio giveaways.

WARNING: This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***



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